ASTRONOMY IN THE OLD TESTAMENT

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AUTHORIZED ENGLISH TRANSLATION
WITH MANY CORRECTIONS AND ADDITIONS
BY THE AUTHOR

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NOTE BY THE TRANSLATOR

THE author of this book is the Director of the Brera Observatory in Milan, and his great reputation as an astronomer causes special interest to attach to his views on Biblical astronomy. He has been kind enough to revise his work throughout for the purpose of the English translation, and also to criticize and amend the translation itself.

The translator, who has undertaken the work at the request of the Delegates of the Clarendon Press, has to express his great obligations to the Rev. Dr. Driver, Regius Professor of Hebrew in the University of Oxford, and to Mr. A. E. Cowley, Sub-Librarian of the Bodleian Library and Fellow of Magdalen College. Both these gentlemen have read the translation and made important corrections; and, while they cannot be held responsible in all cases for the form which it has finally taken, any claims to accuracy which it may possess are due to their assistance.

PREFACE BY THE AUTHOR

THIS little book was published for the first time in Italian in 1903, forming No. 332 of the scientific series in the large collection of Manuals which are being published in Milan by Ulrico Hoepli. A German translation was published at Giessen in 1904, containing some changes and corrections. All these alterations have been adopted in the present version, together with many others which are entirely new.

In presenting it to English readers, I feel bound to express my sincere gratitude to the Delegates of the Clarendon Press and to the translator, who have interested themselves in its publication and have assisted in rendering it less imperfect. Their observations on some doubtful assertions, and on certain points which were open to dispute and not clearly expressed, have led me to make various improvements and to introduce important additions and corrections. Special thanks are also due to my kind and learned friend Monsignor Antonio Ceriani, Prefect of the Ambrosian Library at Milan, who rendered indispensable help in my consultation of some Syriac and Rabbinical works.

Some readers may perhaps notice that not a word is said in this book about some truly sensational novelties which have been published recently (especially by some learned German Assyriologists) in regard to the astronomical mythology of the ancient peoples

of nearer Asia, and to the great influence which this mythology is supposed to have exercised upon the historical traditions of the Hebrews, upon their religious usages, and upon the whole literature of the Old Testament. It cannot be denied that those novelties have a strict connexion with the subject of the present book. When we read, for example, that the seven children of Leah (counting Dinah among them) represent or are represented by the seven planets of astrology[1], we are led to the important conclusion that, at the date when the traditions concerning the family of Jacob were being formed, the Hebrews had some knowledge of the seven planets. And when, in connexion with the story of Uriah, it is indicated that, in the three personages of David, Bathsheba, and Solomon, an allusion is contained to the three zodiacal signs of Leo, Virgo, and Libra[2], we must infer that not only the zodiac, divided into twelve parts, but also the twelve corresponding figures or symbols were known to the first narrator of the story of David under a form analogous to that which we have borrowed from the Greeks. Now it is certain that these and other still more important conclusions could not have been passed over in silence had they already been brought to the degree of certainty, or at least of probability, which history requires. But I do not believe myself to be exaggerating when I say that these investigations are still in a state of change and

[1] Winckler, *Geschichte Israels*, ii. 58 and 122; Zimmern, in *KAT*.[3] p. 625. Dinah is naturally made to correspond to the planet Venus or Ištar.

[2] Winckler, in *KAT*.[3] p. 223.

much uncertainty. When we consider, further, the freedom with which the writers of this school use their own imagination as instrument of research—and the ease with which they construct vast edifices of conjecture on narrow and shifting foundations—no one can be surprised that these ingenious and subtle speculations are very far from having obtained the unanimous agreement of the men who are capable of forming an independent judgement on these difficult subjects.

So much may be said to explain why, in this little book, which is intended for ordinary readers, I have not considered it opportune to take account of investigations which cannot be held to have brought certain results to knowledge. Any one who desires to form some idea of the principles and methods of this school will find a short but substantial account of them in Professor Winckler's book *Die Weltanschauung des alten Orients*, recently published at Leipzig. So far as the Hebrew people are more specially concerned, fuller information is contained in the second volume of the same author's *Geschichte Israels*, and in Alfred Jeremias's work *Das Alte Testament im Lichte des alten Orients*. The general results for the whole of the Semitic East are to be found fully expounded in the volume which Winckler and Zimmern have published jointly, under the form of a third edition of Schrader's well-known work *Die Keilinschriften und das Alte Testament*.

G. SCHIAPARELLI.

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CHAPTER I

INTRODUCTION

The people of Israel, its learned men and its scientific knowledge. — Nature and poetry. — General view of the physical world as given in the Book of Job. — Criticism of the sources.

1. It did not fall to the lot of the Hebrew people to have the glory of creating the beginnings of the sciences, or even to raise to a high level of perfection the exercise of the fine arts: both these achievements belong to the great and imperishable honours of the Greeks. The Jews were not a nation of conquerors; they had little or no knowledge of profound political problems, or of the administrative science which has brought such distinction to the name of Rome. Their natural gifts, as well as the course of events, carried them to a different mission of no smaller importance—that of purifying the religious sentiment and of preparing the way for monotheism. Of this way they marked the first clear traces. In the laborious accomplishment of this great task Israel lived, suffered, and completely exhausted itself. Israel's history, legislation, and literature were essentially co-ordinated towards this aim; science and art were for Israel of secondary importance. No wonder, therefore, that the steps of the Jews' advance in the field of scientific conceptions and speculations were small and feeble: no wonder that in such respects they were easily vanquished by their neighbours on the Nile and the Euphrates.

It would, however, be incorrect to suppose that the Jews were indifferent to the facts of nature, that they paid no attention to the spectacles provided by her in such marvellous

variety, or that they made no attempt to offer any kind of explanation of them. On the contrary, in every part of their literary remains their profound feeling for nature rises to the surface; and it is manifest how open was their mind to acute observations of phenomena and to admiration for all that is beautiful or impressive in them. Their explanation of natural events (so far as it is still possible to trace it in the indications, fragmentary and often uncertain, which are scattered in chance references in the books of the Old Testament) seems to us, as always happens with primitive cosmologies, much more fantastic than rational; yet it was not so exclusively a work of the imagination as to degenerate into arbitrary or unbridled mythology, in the manner which we observe among the Aryans of India or the Hellenes of prehistoric times. It was connected exclusively with the worship of Yahwe: to His omnipotence the Jews referred the existence of the world; they made its changes depend on His will, regarded as subject to frequent alteration; thus the possibility never presented itself to their minds that the operations of the material world occurred in accordance with laws invariably fixed. Hence they gained the foundation of a simple and clear cosmology, in perfect accord with religious ideas, suitable for giving complete satisfaction to men of a primitive type and of simple mind, who were full of imagination and feeling, but not much accustomed to analyse phenomena or their causes.

2. Further, we ought not even to suppose that wisdom was not held in due honour among the children of Israel, and that there were not among them men eminent for superior knowledge and culture, who gained through the possession of these qualities the high esteem of their fellow countrymen. When the whole nation recognized David as their king, eleven of the twelve tribes thought it sufficient to complete the act of recognition by sending to Hebron the hosts of

their warriors in arms. One tribe alone, that of Issachar, sent at the head of the troops 200 of their best and wisest citizens to take part in the deputation. The author of the Books of Chronicles[1] tells us: 'of the sons of Issachar came men that had understanding of the times, to know what Israel ought to do; the heads of them were 200; and all their brethren were at their bidding.' This 'understanding of the times' is referred by some interpreters to the arrangements of the calendar, rendered important among the Jews by the need of regulating their festivals and sacrifices: and this opinion seems not to be devoid of probability[2].

The same author speaks in another place of three families dwelling in the town of Jabez, renowned for having exercised from father to son the profession of scribe, that is to say, of literature[3]. Great was also the reputation of the wise men of Edom, a country inhabited by a people scarcely different from Israel, and long considered by them as brothers. The author of the Book of Job has put into the mouth of five Edomite sages his most profound reflections concerning the origin of evil and universal justice. The wisdom of the Edomites and their prudence in important decisions had passed into a proverb[4].

One of the greatest praises bestowed upon Solomon has

[1] 1 Chron. xii. 32.

[2] The opinion of Reuss and Gesenius, who see in these learned men of Issachar so many astrologers, seems to me less probable; 200 astrologers for one of the smaller tribes seem to be excessive. It may also be doubted whether real astrologers existed in Israel at this epoch. The Septuagint takes the matter differently, translating—*γινώσκοντες σύνεσιν εἰς τοὺς καιρούς*. See Reuss's *Commentary*: Gesenius's *Thes.* p. 994.

[3] 1 Chron. ii. 55. I adhere to the sense in which this passage has been understood by the Septuagint and in the Vulgate, though the majority of modern translators dissent from it. As for the 'City of Books' (*Qiryath-sepher*, Judg. i. 11 sqq.), that would rather be evidence for the culture of the Canaanites than of the Israelites.

[4] Obad. 8; Jer. xlix. 7; Baruch iii. 22.

reference to his vast scientific knowledge. We read in the first Book of Kings[1]: 'The wisdom of Solomon was greater than the wisdom of all the men of the East, and of all the Egyptians. He was wiser than all men; wiser than Ethan the Ezrahite, and Heman, and Calcol, and Darda, the sons of Mahol; and his fame was in all the nations round about. . . . He spake of trees, from the cedar tree that is on Lebanon even to the hyssop that springeth out of the wall; he spake also of beasts, and of birds, and of creeping things, and of fishes.' Here we see that several sages of less celebrity than Solomon, men like Ethan, Heman, Calcol, and Darda, held a distinguished place in the memory of their fellow countrymen.

In the Book of Wisdom (vii. 17–21), Solomon is introduced speaking of himself according to the popular view: 'God gave me an unerring knowledge of all things that are, to know the constitution of the world and the operation of the elements; the beginning, and end, and middle of times, the circuits of years, and the dispositions of stars, the alternations of the solstices, and the changes of seasons; the nature of living creatures, and the raging of wild beasts, the violence of winds, and the thoughts of men; the diversities of plants, and the virtues of roots. All things that are secret and unforeseen, I learned, for she that is the artificer of all things taught me, even wisdom.'

3. From the first the contemplation of the created world was exalted by the Jews to the honours of poetical treatment. In no other ancient literature has nature given to poets more copious and purer springs of inspiration. On this subject Alexander von Humboldt has expressed some noble and true thoughts: 'It is characteristic of Hebrew poetry in reference to nature that, as a reflex of monotheism, it always embraces the whole world in its unity, comprehending the

[1] 1 Kings iv. 30–33.

life of the terrestrial globe as well as the shining regions of space. It dwells less on details of phenomena, and loves to contemplate great masses. Nature is portrayed, not as self-subsisting, or glorious in her own beauty, but ever in relation to a higher, an over-ruling, a spiritual power. The Hebrew bard ever sees in her the living expression of the omnipresence of God in the works of the visible creation. Thus, the lyrical poetry of the Hebrews in its descriptions of nature is essentially, in its very subject, grand and solemn[1].'

4. The similes and comparisons in the Biblical writers, taken from the heaven, the earth, the abysses, the sea, the phenomena of air and water, and from the whole animal and vegetable world, are numberless. The vivid impression which those writers received from this source finds expression of the sublimest kind in the work of one of their greatest thinkers, the author of the Book of Job. In chapters xxxviii and xxxix, which may be considered to be one of the finest passages of Hebrew literature, God is Himself introduced as speaking, with the object of convincing Job that he is wrong to lament his misfortunes, unmerited though they are. He makes Job see that he has no knowledge of the dispositions according to which the world is constituted and governed, and that he cannot comprehend any part of the designs of the Almighty. With this aim in view He places before Job's eyes, in order, the great mysteries of nature, so that Job may be convinced of his ignorance and nothingness:

38 2 Who is this that darkeneth counsel
By words without knowledge?
3 Gird up now thy loins like a man;
For I will ask of thee, and declare thou unto me.
4 Where wast thou when I laid the foundations of the earth?
Declare, if thou hast understanding.

[1] A. von Humboldt, *Cosmos* (Eng. tr. by Lt.-Col. E. Sabine, ii. 44).

5 Who determined the measures thereof, if thou knowest?
Or who stretched the line upon it?
6 Whereupon were the foundations thereof fastened?
Or who laid the corner stone thereof;
7 When the morning stars sang together,
And all the sons of God shouted for joy?
8 Or who shut up the sea with doors,
When it brake forth, as if it had issued out of the womb;
9 When I made the cloud the garment thereof,
And thick darkness a swaddlingband for it,
10 And prescribed for it my decree,
And set bars and doors,
11 And said, Hitherto shalt thou come, but no further;
And here shall thy proud waves be stayed?
12 Hast thou commanded the morning since thy days began,
And caused the dayspring to know its place?
. . . . . .
16 Hast thou entered into the springs of the sea?
Or hast thou walked in the recesses of the deep?
17 Have the gates of death been revealed unto thee?
Or hast thou seen the gates of the shadow of death?
18 Hast thou comprehended the breadth of the earth?
Declare, if thou knowest it all.
19 Where is the way to the dwelling of light,
And as for darkness, where is the place thereof;
20 That thou shouldest take it to the bound thereof,
And that thou shouldest discern the paths to the house thereof?
21 Doubtless, thou knowest, for thou wast then born,
And the number of thy days is great!
22 Hast thou entered the treasuries of the snow,
Or hast thou seen the treasuries of the hail,
23 Which I have reserved against the time of trouble,
Against the day of battle and war?
24 By what way is the light parted,
Or the east wind scattered upon the earth?
25 Who hath cleft a channel for the water-flood,
Or a way for the lightning of the thunder;
26 To cause it to rain on a land where no man is;
On the wilderness, wherein there is no man;

27 To satisfy the waste and desolate ground ;
And to cause the tender grass to spring forth ?
28 Hath the rain a father ?
Or who hath begotten the drops of dew ?
29 Out of whose womb came the ice ?
And the hoary frost of heaven, who hath gendered it ?
30 The waters are hidden as with stone,
And the face of the deep is frozen.
31 Canst thou bind the cluster of the Pleiades,
Or loose the bands of Orion ?
32 Canst thou lead forth the Mazzaroth[1] in their season ?
Or canst thou guide *'Ayish* and her children ?
33 Knowest thou the ordinances of the heavens ?
Canst thou establish the dominion thereof in the earth ?
34 Canst thou lift up thy voice to the clouds,
That abundance of waters may cover thee ?
35 Canst thou send forth lightnings, that they may go,
And say unto thee, Here we are ?
. . . . . .
37 Who can number the clouds by wisdom ?
Or who can pour out the bottles of heaven,
38 When the dust runneth into a mass,
And the clods cleave fast together ?
39 Wilt thou hunt the prey for the lioness ?
Or satisfy the appetite of the young lions,
40 When they couch in their dens,
And abide in the covert to lie in wait ?
41 Who provideth for the raven his food,
When his young ones cry unto God,
And wander for lack of meat ?
39 Knowest thou the time when the wild goats of the rock bring forth ?
Or canst thou mark when the hinds do calve ?
2 Canst thou number the months that they fulfil ?
Or knowest thou the time when they bring forth ?
3 They bow themselves, they bring forth their young,
They cast out their sorrows.

[1] On Mazzaroth and *'Ayish*, see below §§ 41, 63, and 69.

4 Their young ones are in good liking, they grow up in the open field;
They go forth, and return not again.
5 Who hath sent out the wild ass free?
Or who hath loosed the bands of the wild ass?
6 Whose house I have made the wilderness,
And the salt land his dwelling place.
7 He scorneth the tumult of the city,
Neither heareth he the shoutings of the driver.
8 The range of the mountains is his pasture,
And he searcheth after every green thing.
9 Will the wild-ox be content to serve thee?
Or will he abide by thy crib?
10 Canst thou bind the wild-ox with his band in the furrow?
Or will he harrow the valleys after thee?
11 Wilt thou trust him, because his strength is great?
Or wilt thou leave to him thy labour?
12 Wilt thou confide in him, that he will bring home thy seed,
And gather the corn of thy threshing-floor?
13 The wing of the ostrich rejoiceth;
But are her pinions and feathers kindly?
14 For she leaveth her eggs on the earth,
And warmeth them in the dust,
15 And forgetteth that the foot may crush them,
Or that the wild beast may trample them.
16 She is hardened against her young ones, as if they were not hers:
Though her labour be in vain, she is without fear;
17 Because God hath deprived her of wisdom,
Neither hath he imparted to her understanding.
18 What time she lifteth up herself on high,
She scorneth the horse and his rider.
19 Hast thou given the horse his might?
Hast thou clothed his neck with the quivering mane?
20 Hast thou made him to leap as a locust?
The glory of his snorting is terrible.
21 He paweth in the valley, and rejoiceth in his strength:
He goeth out to meet the armed men.
22 He mocketh at fear, and is not dismayed;
Neither turneth he back from the sword.

23 The quiver rattleth upon him,
The flashing spear and the javelin.
24 He swalloweth the ground with fierceness and rage;
Neither standeth he still at the sound of the trumpet.
25 As oft as the trumpet soundeth he saith, Aha!
And he smelleth the battle afar off,
The thunder of the captains, and the shouting.
26 Doth the hawk soar by thy wisdom,
And stretch her wings toward the south?
27 Doth the eagle mount up at thy command,
And make her nest on high?
28 She dwelleth on the rock, and hath her lodging there,
Upon the crag of the rock, and the strong hold.
29 From thence she spieth out the prey;
Her eyes behold it afar off.
30 Her young ones also suck up blood:
And where the slain are, there is she.

. . . . . .

40 2 Shall he that cavilleth contend with the Almighty?
He that argueth with God, let him answer it.

This superb enumeration, which will only appear long to those who are accustomed to judge everything according to the ideas of their own time, contains a complete picture of the physical world, such as perhaps had not previously been conceived by any one. Nor is this the only review of the works of nature with which we meet in the Old Testament. There are, besides, the well-known account offered by Genesis in the story of the creation, and the grand description to be found in Psalm civ[1]. Noteworthy also, if shorter and less complete, are the other picture in Job (ch. xxvi), and those in Psalms cxxxvi and cxlviii and in Proverbs (ch. viii). We see that this subject, both through its grandeur and through its variety, riveted the imagination of the people,

[1] We may add that in Ecclus. xliii, and the one contained in the Song of the Three Children in the furnace (Dan. iii. 52–90, Apoc.), which are wanting in the Hebrew Bible and are to be considered as more recent imitations.

and gave to their greatest poets opportunities for attractive pictures which are capable of arousing admiration as much now, and at all times, as they were then.

5. In these fine passages there emerges beyond all other considerations the admiring and enthusiastic contemplation of the heaven, the earth, the abysses, in short, of the whole grand fabric of the universe. And, as mystery is always the source of marvel and wonder, the effect on these minds, ignorant of doubt and criticism, was so much the greater, as the heavens, the earth below its surface, the bottom of the sea, the abysses, were considered to be secrets, inscrutable to human thought. 'Knowest thou the ordinances of the heavens?' is a question which God asks of Job along with a number of others which are equally hard to answer[1]. The same conception is to be found in the Book of Wisdom: 'And hardly do we divine the things that are on earth, and the things that are close at hand we find with labour; but the things that are in the heavens, who ever yet traced out[2]?' It was considered impossible for man to arrive at the understanding of such secrets; and hence every attempt to acquire it was useless, unless it were gained by special gift of God, as appears to have been understood to be the case with Solomon[3]. But what chiefly alienated the Jews from the study of the visible heavens was the consideration that the neighbouring nations of Mesopotamia had been conducted from astronomy to astrology, and from astrology to astrolatry, that is to say, to the worship of the sun, the moon, 'and all the host of heaven': a worship which was, for the Jews, no less of an abomination than sacrifices to Baal, Astarte, or Moloch, and had become all the more detestable since the time when, under certain kings of Judah, such a cultus had finally penetrated into Jerusalem, and profaned the Temple

[1] Job xxxviii. 33. [2] Wisd. ix. 16.

[3] This is expressly affirmed in Wisd. vii. 17, in Solomon's name.

of Yahwe itself. Accordingly the prophets never wearied of threatening the most terrible judgements on star-worshippers. One of the greatest writers of the Exile, the anonymous author of the second part (ch. xl–lxvi) of the book bearing the name of Isaiah, when foretelling the humiliation of Babylon, exclaimed[1]: 'There arise, therefore, in thy help the measurers of the heaven, the star-gazers, who, at each new moon, proclaim the things that shall come upon thee. Behold, they are as stubble, the fire burneth them; they deliver not themselves from the power of the flame.' Jeremiah says to the sinners of the kingdom of Judah[2]: 'In that day, saith the Lord, shall the bones of the king of Judah be brought out of their graves, and the bones of his princes, and the bones of the priests, and the bones of the prophets, and the bones of the inhabitants of Jerusalem. And they shall be spread before the sun, and the moon, and all the host of heaven, which they have loved and served, and after which they have walked, and which they have sought, and which they have worshipped; they shall not be gathered nor buried, but shall be for dung upon the face of the earth.' Similarly, Zephaniah, speaking in the name of the Lord[3]: 'I will stretch out my hand against Judah, and against all the inhabitants of Jerusalem, and I will scatter . . . those that worship the host of heaven upon the house-tops, and after worshipping and swearing to the Lord, swear to Milcom also.' In Isaiah we find horror against star-worship carried to the point of causing him to predict the destruction of the stars[4]: 'And all the host of heaven shall be dissolved, and the heavens shall be rolled together as a scroll, and all their host shall fall down, as a leaf falleth off from a vine or from a fig-tree.' The enforced contact into which Israel was destined to come with her oppressors of Nineveh and

[1] Isa. xlvii. 13, 14. [2] Jer. viii. 1, 2. [3] Zeph. i. 4, 5.
[4] Isa. xxxiv. 4.

Babylon, certainly could not induce her to participate in their customs, their arts, and their science; she concentrated herself on her own struggle and her own hopes, looking for better times.

6. In view of these considerations, there is no occasion for surprise in the fact that astronomy among the Jews remained practically at the stage which we know to have been attained (and, for that matter, sometimes surpassed) by some native peoples of America and Polynesia. But the Jews have had the fortune to preserve through the centuries the better part of their literature, and the still more remarkable fortune of seeing this literature spread through the whole world as the primary basis of Christianity, and thus become the intellectual heritage, if not of the largest, at any rate of the most intelligent part of the human race. It follows that, much more than with the Babylonians, the Egyptians, the Phoenicians, and the early Arabs, we are in a position to form a definite idea of the Jewish astronomical notions and of Jewish cosmography, favoured as we are in this by the fact that the Biblical writers make so many allusions to these subjects.

This thought has moved me to believe that it might be a work of some interest to discover what ideas the ancient Jewish sages held regarding the structure of the universe, what observations they made of the stars, and how far they made use of them for the measurement and division of time. It is certainly not in this field that Jewish thought appears in its greatest originality or power. Yet it is also true that nothing can be indifferent in the life of that remarkable people whose historical importance is certainly not less for us than that of the Greeks and Romans.

7. The foundation for such researches must naturally be laid in the Hebrew text of the books composing the Old Testament, wherever, that is to say, we feel secure that our interpretation of its sense is correct. It must, indeed, be

admitted that we are still far from this position; there is a large number of words and phrases in regard to which the most eminent commentators have not been able to agree. And in this number many are words describing astronomical facts and phenomena. It might be supposed that we ought here to hope for much assistance from the ancient versions, and especially from the Septuagint, a translation made by Hellenistic Jews not more than two or three centuries after Ezra, and consequently at an epoch when the genuine tradition as to the meaning of every Hebrew word in the sacred writings should have still been alive among the doctors of the Law. But in actual fact I have not found that this hope is materially confirmed, at least in the present instance: whether because in treating of subjects which may be described as technical and not always familiar to the majority of men, it easily happened that the true meaning of the words relating to them became rapidly lost; or because in this version and the others comparable to it in point of antiquity (Aquila, Symmachus, the Vulgate, the Peshiṭta), made exclusively for religious use and for the edification of the faithful, it was not really necessary and not even particularly useful to take trouble in seeking for an irreproachable version of such scientific minutiae, which in many cases could not be found. In such cases of grave doubt I have had no other alternative open to me than to leave the judgement to the reader without prejudice, after having faithfully expounded the position of the question and having placed before him the opinions of the most authoritative interpreters and commentators, while at the same time indicating what views appear unlikely and which seem to have the greatest probability in their favour.

8. This is not, however, the only difficulty with which our undertaking meets. Under one name, and in one volume of no great bulk, the Old Testament contains many writings

of very different epochs; and it would be hard to assert that they all contained an absolutely identical conception of the world and of celestial phenomena. And although it is true that, as we are treating of ideas which are quite primitive and depend upon the simplest testimony of the senses, we cannot look for much diversity in such a subject-matter, we must also admit that discrepancies in details are found here and there between one writer and another. We have an example of this in the theories of rain held by the authors of Genesis and of Job. Yet, speaking generally, so far as cosmology is concerned, all the writers appear to have conceived the facts of nature according to a common type of view which does not vary in its main outlines.

One meets with more difference between the various epochs of Biblical Judaism in what concerns the manner of marking the divisions of time, and in the use of fixed septenary periods. It is impossible to grasp these subjects in their historical order, without determining approximately, in regard to some of the writers cited in evidence, the period at which they lived: in several cases, and especially in those of the writers in the Pentateuch (who are the most important), these epochs still form the subject of the hottest disputes. Thus, to take an example, in order to judge adequately of the historical value of the surviving notices affecting the great half-century period of the Jubilee, it is necessary to know approximately at what epoch chapters xxv and xxvii of Leviticus were written: some believe these chapters to be the work of Moses himself, others date their composition about 1,000 years later, after Ezra!

9. The critical analysis of the Pentateuch, both literary and historical, is a difficult problem, on which the most learned investigators have been engaged with the greatest industry for a century and a half; unfortunately, the results have not always been proportionate to the extent and merits

of their labours. Their researches, being conducted by methods mostly conjectural (and indeed the material rarely admits the use of any others) and founded on criteria that are too often entirely subjective, have led from the first to a chaos of discordant conclusions. For in this, as in all scientific problems of great complication and difficulty, it seems that the human mind is condemned not to attain the truth without having first tried a large number of mistaken hypotheses and passed through a whole labyrinth of error. However, the patience and perseverance of these investigators has occasionally been rewarded by the discovery of some particular facts which they have succeeded in proving in a manner sufficiently plausible and convincing. The accurate study of these facts, and of their relationship, and the careful arrangement of them have borne good fruit.

In the midst of many aberrations and contradictions, there has gradually come to be traced out during the last fifty years a line of inquiry which is less arbitrary and founded on more secure principles, the results of which, successively corrected by severe criticism, seem to rest on a foundation sufficiently solid to inspire a definite degree of confidence. I allude to the theory of Reuss and Graf, with which many of the most authoritative scholars have recently come to agree[1]: it will suffice to name Wellhausen, who, in his

[1] Two Italian writers have also founded their important labours on the hypothesis of Reuss: Castelli (*Storia degli Israeliti*, 2 vols., Hoepli, Milan, 1887-8), and Revel (*Letteratura Ebraica*, 2 vols., Hoepli, Milan, 1888). Both deserve praise for the spirit of fairness and moderation which they have brought to the treatment of these thorny problems. Castelli in another work (*La Legge del popolo Ebreo*) has further proposed some additions and modifications to Reuss's theory. [The English reader may be referred to Reuss's own work *L'Histoire Sainte et la Loi* (1879), being the introductory volume to his translation into French of the entire Bible. See also W. Robertson Smith's *Old Testament in the Jewish Church*, or Driver's *Introduction to the Literature of the Old Testament*.]

Prolegomena zur Geschichte Israels, has established its foundations in the clearest and most rigorous fashion. If we strip off from these writers' arguments as much as appears to be less securely asserted and less effectually proved, there yet remains the possibility of establishing with sufficient historical probability this important fact: that the final redaction of the Pentateuch, far from being contemporary with the entry of the children of Israel from Egypt to the land of Canaan, belongs rather to the latest times of Biblical Judaism, and forms, so to speak, its final and most complete product. The Pentateuch appears as a compilation of religious, historical, and legislative matter, belonging to the most different epochs, from Moses to after Ezra: a compilation the materials of which are not always fused together, but very frequently placed merely in juxtaposition, so as to allow an approximate reconstitution of the original documents, or at any rate a probable classification according to tendencies and dates.

10. As regards its religious and legislative part, which affords more facilities for analysis, we can distinguish three strata:—

(i) The *First Code* or *Book of the Covenant*[1], which represents for us the most ancient and most simple form of the laws of Mosaism. This has been preserved (though not, as it appears, quite completely) in Exodus, chapters xxi–xxiii, and is preceded by the Decalogue which forms a sort of introduction to it. Its date is uncertain; but I shall show hereafter by certain internal marks that it ought in any case to be considered as earlier than the age of Solomon. I believe that it very probably represents the first codification of the ancient usages and rites of the people of Israel, according to the principles and traditions traced to Moses.

[1] *Sepher Bĕrith*, expressly cited under this name in Exod. xxiv. 8.

(ii) The *Prophetic Code*, including the greater part of what we now call Deuteronomy[1], represents the collection of the laws of Moses as they were understood by the prophets of the two centuries preceding the destruction of the first Temple. This too is preceded by the Decalogue, which serves as an introduction to it. It is generally allowed that the "book of the law," found in the Temple and proclaimed by King Josiah of Judah[2] in 621 B.C., was no other than the Prophetic Code. (iii) All the other laws of the Pentateuch which remain after excluding the First Code and the Prophetic Code are comprehended (with some small exceptions) in the *Priestly Code*, so called because of the great prominence assumed in it by the exposition of ritual and the theory of ceremonies. These laws take the form, not so much of a real code, as of a collection of rules and ordinances of every age, imperfectly arranged, some of them repeating, with more or less modification, those of the earlier codes, others seeming to reproduce under the form of the service of the tabernacle the ritual of Solomon's Temple; the greater part contains all the studies and speculations made during the exile and from the exile down to comparatively late times (i.e. to about 400 B.C.) on the civil and religious order which was to be given to the new hierocratic community, which was gradually being formed round the second Temple.

11. To the Priestly Code there came to be united a brief narrative of the origins of the world and of man, the story of the flood and the patriarchs, of the liberation from Egypt, of the law given at Sinai, and the conquest of the land of Canaan. This narrative, distinguished by its mass of numbers and genealogical schemes, was intended primarily to serve as an historical introduction to the Mosaic laws, and as a commentary illustrating their origin and the reason for their existence—without entering too much into other par-

[1] Strictly speaking, Deut. v–xxv. [2] 2 Kings xxii–xxiii.

ticulars. Fortunately, the compiler of the Pentateuch had at his disposal, besides this account, another of the same facts, far more detailed and picturesque, gathered from old chronicles, songs, and popular oral traditions, at a time much nearer to the events related, while the kingdoms of Israel and Judah still existed before the Assyrian invasion. This second narrative was interwoven by him with the first, and to it is principally due that simple and inimitable beauty which distinguishes the historical part of the Pentateuch. The two narratives are so different in style, and the final compiler has so religiously preserved the original diction (only making excisions when useless repetitions would otherwise have occurred), that very often it is possible successfully to separate what belongs to the one or the other of the two narrators[1], and to judge in this way what degree of antiquity or authority is to be attributed to this or that particular of the facts related.

This much may suffice to give an idea of the criteria on which I have believed that I ought to rely, in cases where it is of importance to have some kind of notion of the date at which a given passage was written, whether in the Pentateuch, or in the Book of Joshua, which may be

[1] This must not, however, be carried to the extreme of supposing that we can separate and assign to their authors every chapter or verse or fragments of verses, as some have recently believed that they can. As in such an operation analysis endeavours to pass the fixed limits within which a reasonable agreement can be obtained, and within which such an agreement has in fact been obtained, it falls on the shifting and difficult ground of personal opinions, and criticism ceases to be a science worthy of respect. On this and other abuses in the analysis and interpretation of the Biblical texts, see the severe and just reflections of Prof. F. Scerbo in his work entitled, *Il Vecchio Testamento e la critica odierna*, Florence, 1902; and in the same sense Castelli, *Storia degli Israeliti*, Introd. pp. lvii–lviii. The result of these excesses has been to create in regard to these studies an atmosphere of doubt and distrust which is extremely injurious to the cause of truth.

considered as an appendix dependent on the same sources. Speaking generally, the conclusions to which I have been brought within the narrow field of my present studies have confirmed the accuracy of these criteria, and have thus contributed something towards establishing them still more firmly.

For other books of the Old Testament, the chronological question does not exist, or at least it does not exist in such a way as to assume much importance. None of the historical books, beginning with the Book of Judges and going down to the Books of Chronicles, has given rise to such grave differences of opinion as those of which the Pentateuch and the Book of Joshua are still the subject. On the other hand, the date of some of the so-called Hagiographa, and especially of the collections of Psalms and Proverbs and the Book of Job (which is so important for our purpose), is still more or less uncertain. But it will be seen that the notices taken from these sources belong for the most part to the general heritage of Jewish wisdom, and the precise determination of their date rarely has to be considered as of great importance for our purpose.

12. So much may be said about the books of the Old Testament, which are our principal and practically our only source of information. It may now be asked whether the people of Israel, which is found at different times in close contact with peoples of advanced culture, such as were the Egyptians, the Phoenicians, and the Babylonians, might not have absorbed a portion of their ideas: in which case we should have a new line of evidence.

To this it may be answered that, so far as Egypt is concerned, the many years which the Jews according to tradition passed there before the time of Moses, do not seem to have left many noteworthy traces upon them. The Jews took but little from the Egyptians: so little as to give rise in some modern writers to the supposition that the

sojourn in Egypt and the exodus following upon it are pure legend and devoid of historical foundation.

The culture of the Phoenicians, who belonged to the family of the Canaanites and spoke a language which was almost identical with that of the Jews, was certainly bound to exercise a powerful influence over them: signs of this are found in the oldest Jewish calendar, but still more in the continued tendency, lasting through several centuries and only repressed with difficulty, to fall into the idolatry of the Canaanites. A comparison of the Biblical writings with the historical, religious, and literary monuments of the Phoenicians would therefore be interesting in many respects. Unfortunately, nearly all these monuments are lost; nor can the so-called Sanchuniathon give any assistance for our object. We can only imagine in general that the Phoenicians, being accustomed to commerce on a large scale and to long voyages, must have possessed, more than other peoples, extensive and exact notions of geography, astronomy, meteorology, and the principles of navigation: what these were, it is no longer possible to know. From the Phoenician inscriptions, however, some information can be derived relating to the oldest Jewish calendar which was in use down to the times of Solomon.

The case is rather more favourable in regard to the Babylonians, on whose literature the cuneiform inscriptions begin to throw some light. In the course of this book opportunities will occur from time to time for making useful and interesting comparisons between the cosmographical conceptions of the Jews and of the Babylonians. Yet these are not so numerous as some might imagine. In spite of the close analogy between the two languages, pointing to a common origin, the wide difference between the historical evolution of the two peoples has resulted in destroying many important similarities and producing many profound differ-

ences. I will content myself, remaining within the limits of my subject, with pointing to the deeply significant fact that of the five or six names of constellations occurring in the Old Testament, not one has been hitherto recognized among the numerous names of constellations found on the cuneiform inscriptions. Nor should this give rise to any surprise. Even after having subjugated and assimilated the peoples of Canaan, the Israelites preserved many traditions from the time when they wandered in the state of nomadic tribes in the deserts of Arabia and Syria. The Babylonians, on the other hand, were heirs of the Sumerian culture, adopted its principal elements, and developed in a totally different direction from the Jews.

It is no doubt possible that, in the Jewish writings of the Hellenistic and the Talmudic periods, cosmological ideas are here and there concealed, which are derived from Babylonian science. This is perhaps the case with the singular cosmography adopted in the pseudonymous Book of Enoch, presenting noteworthy analogies with the cosmography which we find expounded in the sacred books of Mazdeism [1]. These analogies would in themselves provide a problem worthy of study, and they would probably result in the belief that the Jews and the Mazdeists derived the doctrine in question from a common source, which could only be Babylonian science in the last stage of its evolution. The problem would lie outside the limits set for the present work, in which it is proposed only to consider pure Biblical Hebraism, and not Hebraism as modified by Hellenism and by the influence of oriental doctrines.

[1] Not, strictly speaking, in the extant part of the Avesta, but in the treatise *Bundahish*, the material of which is believed to be derived from lost books of the Avesta, i.e. from the *Dâmdâd Nask* and perhaps also from the *Nâdar Nask*, the 4th and 5th books of the twenty-one which originally composed the Avesta. (See West, *Pahlavi Texts*, iv. 14, 414, 421, 434, 445, 465.)

CHAPTER II

THE FIRMAMENT, THE EARTH, THE ABYSSES

General arrangement of the world. — The earth's disk. — Limits of the regions known to the Jews. — The earth's foundations. — The abyss and Sheol. — The firmament. — The upper and lower waters. — Theory of subterranean waters and of springs, of rain, snow, and hail: the clouds. — General idea of Hebrew cosmography.

13. About the form and general arrangement of the visible world the Jews had much the same ideas as we find originally in all peoples, ideas which have satisfied at every time the greater part of men even among nations with a pretence to culture: in fact, the cosmography of appearances.

A nearly plane surface including the continents and seas constituted the earth destined for men's habitation. The universe was divided into two parts, upper and lower. Above was heaven, the Hebrew *shamayim* or *the uplifted*[1], with the appearance of a large vault supported round about upon the extreme parts of the earth. Heaven includes all the upper part of the world: it is the kingdom of light and of meteors, and the stars revolve in its highest part. Under the surface of the earth are the actual mass of the earth, and the depth of the sea, forming together the lower part of the universe, dark and unknown: this came, in opposition to heaven, to be described by the name *tĕhōm* (or plural *tĕhōmōth*)

[1] If at least we may accept Gesenius's derivation from the root *samā*, which is preserved in Arabic with the meaning *altus fuit*, and also *apparens, conspicuus fuit*. (Gesenius, *Thes.* p. 1433, *nomen habet coelum ab elatione et altitudine.*)

having the sense of depth and rendered by *abyss* in the Greek and Latin translations of the Bible, a word which has now passed into general use among ourselves also[1].

14. The vast plain of the earth, partly occupied by the sea, partly by continents studded with mountains and furrowed by rivers, is of a circular shape, like the heaven which covers it; it is surrounded by water which extends as far as the point where the heaven begins. So we read in the Book of Job (xxvi. 10) that God 'fixed a circle as limit to the waters, at the boundary of light and darkness': that is to say, at the point where the illuminated part of the world (land, sea, and heaven) comes into contact with the dark part (the abysses and the depth of the sea). Similarly in Proverbs (viii. 27) mention is made of the time when God 'drew the circle which is over the surface of the deep.' This circle can be nothing else than the visible limit where the heaven and the sea encircling the continents touch each other round about. It is probably to this circle that allusion is made in Job (xxii. 14) where God is described as 'walking in the circuit of heaven'—that is to say, the spherical space bounded by the circle which forms the limit of heaven and earth. The distance between heaven and earth and the dimensions of

[1] Gesenius derives *tĕhōm* from the root *hum*, signifying disturbance, violent motion, confusion: whence this word could be applied to the sea and to any large body of water. The Biblical writers certainly often use *tĕhōm* in the former sense, more rarely in the latter. This agrees well with the recently-noticed analogy with the Assyrian *tiamtu* = sea, see Schrader, *KAT.*[2] p. 6 [*The Cuneiform Inscriptions and the Old Testament*: English translation by O. C. Whitehouse, where the German pages are given in the margin]. But, that the Jews always included in the word *tĕhōm* the idea of depth, even when using it of the sea, is proved by the tradition (in this respect most trustworthy) of the LXX; there it is invariably considered as equivalent to ἄβυσσος, which implies great depth, or, strictly speaking, *something bottomless*. The passages of the Bible in which this word indicates the lower or deeper parts of the universe, will be collected further on.

earth itself are immense and such that no man can measure them. 'Who hath fixed the measures of the earth?' God asks of Job (xxxviii. 5), 'or who placed the line above it to measure it?' And elsewhere (xxxviii. 18): 'Hast thou known the breadth of the earth? declare it me, thou who knowest everything.' So absurd did the idea of being able to measure heaven and earth appear, that Jeremiah makes the Lord say, to indicate something impossible (xxxi. 37): 'When the heavens above can be measured, and the foundations of the earth can be searched out beneath, then only will I cast off from me all the seed of Israel.' The great height of the heavens and the circular form of the earth are clearly indicated in Isaiah (xl. 22): 'He (the Lord) sitteth on high above the circle of the earth, and the inhabitants of it are to him as locusts[1].' In the centre of the terrestrial circle is Palestine, Jerusalem being the absolute centre: 'Thus saith the Lord: this is Jerusalem; I have placed her in the midst of

[1] The word used here is *ḥug* = circle; from the same root comes *meḥugah* = compass (Isa. xliv. 13). The phrase *orbis terrarum*, so common in the Vulgate, is to be understood to imply (as always with Latin writers) the whole of the known regions of the earth, without adding any idea of roundness. Similarly, the word *Erdkreis* and the inappropriate form *Erdball*, which German translators have introduced into the Bible where *Erde* alone would have been the literal equivalent, are to be understood in the same way. From a passage in Isaiah (xi. 12) and another in Ezekiel (vii. 2), where mention is made of the four *kanephoth* of the earth, some have wished to conclude that the Jews pictured the earth to themselves as square: but there is little ground for this theory. The parallel passages of Isaiah (xxiv. 16) and Job (xxxvii. 3 and xxxviii. 13) show that the allusion here is to the extreme parts of the terrestrial disk, corresponding to the directions of the four principal winds (see below, § 22). This is the only possible way of reconciling the four *kanephoth* with the circular form of the earth and the heaven.—The *four edges* of the earth recall the title 'King of the four parts of the earth' (*šar kibrat irbitti*) which is used by many kings of Babylonia and Assyria and contains an analogous idea (see Jensen, *Kosmologie der Babylonier*, p. 167 sqq.).

the nations, and all the lands are in a circle round about her[1].'

15. On the plain thus described there are arranged round the centre the nations of the earth and Noah's descendants, as expounded in Genesis x. They occupy round the centre a space whose limits, for the Jews before the exile, did not exceed thirty degrees (about 1875 English miles), whether latitudinally or longitudinally. The furthest countries in any sense known were: to the east, Persia and Susiana (*Paras* and *Elam*), with Media (*Madai*)[2]: to the north, Caucasia, Armenia, the regions of Asia Minor along the Black Sea (*Magog*, *Togarmah*, *Ararat*, *Gomer*)[3]; to the west, the southern outskirts of Greece, the Archipelago, Ionia (*Elisha*, *Javan*), Crete (*Caphtor*?), and the Libyan peoples west of Egypt (*Lubim*); to the south, Ethiopia (*Cush*, *Phut*?), Yemen (*Saba*), Ḥadramaut (*Ḥazarmaveth*), and eastern Arabia (*Ophir*, *Regma* [R.V. *Raamah*]), completed the circle. Of the southern extremity of Europe they had only a general and

[1] Ezek. v. 5. In the Vulgate and LXX the *navel of the earth* is mentioned more than once (Judg. ix. 37; Ezek. xxxviii. 12). Recent interpreters, instead of this, translate by 'lofty places' or 'heights of the earth,' understanding the word 'navel' in a metaphorical sense. We cannot, therefore, use these texts as evidence of Jewish cosmography. The conception of Jerusalem's central position was also adopted by some Christian writers of the first centuries and of the Middle Ages: it formed, as is well known, a fundamental point in Dante's geography.

[2] Some believe the 'land of Sinim' (Isa. xlix. 12) actually to represent China. This hypothesis is more ingenious than probable. The LXX evidently did not think of China, as they translate ἐκ γῆς Περσῶν. See, on the other side, Gesenius, *Thes.* pp. 948–50. The opinion which would recognize in Rosh, Meshech, and Tubal (Ezek. xxxviii. 1, 3) the names of Russia, Moscow, and Tobolsk, is entirely absurd. But it is probable that Hodu (Esther i. 1, and viii. 9) does really represent India, some knowledge of which, after the expedition of Alexander, might have reached as far as Palestine [so A.V. and R.V.].

[3] For Ezekiel (xxxviii. 6), Togarmah is the most northerly country of the inhabited earth.

very confused idea ('the islands of the nations'), which they undoubtedly derived from the stories of the Phoenicians who had told them of the marvels of Tarshish [1].

The Jews knew, besides the Mediterranean (called by them *yam haggadol*, i. e. great sea, or *yam haaḥăron*, i. e. western sea), the Red Sea (*yam suph*, i. e. sea of weeds, or *yam Mizrayim*, i. e. sea of Egypt), and the Dead Sea (*yam hammelaḥ*, i. e. sea of salt, or *yam haʿărabah*, i. e. sea of the steppe). They may possibly, even before the exile, have had some knowledge of the Persian Gulf and the Black Sea; but no mention of them is found in the books of the Old Testament. A passage in Genesis might lead us to believe that they conceived all the seas as being in communication with each other [2]. But in that case the connexion with the Dead Sea could be only subterranean.

Besides the portions inhabited by Noah's descendants there were other districts, imagined rather than known, extending to the great surrounding sea which was supposed to touch the columns of heaven, that is to say, the base of the great vault [3]. Genesis and several of the prophets [4] speak of the 'garden of God' in the region called Eden, the first home of Adam and Eve. They seem to have thought of this place as in the eastern parts of the earth, a supposition which was preserved throughout Christian tradition down to Christopher Columbus. Still more east than Eden they placed the land of Nod (LXX, Ναίδ), the abode of Cain and his descendants (Gen. iv. 16).

[1] This was an exceedingly rich country situated in the extreme west at a great and uncertain distance. It is not quite certain to what it corresponds: a plausible hypothesis, resting on the authority of the LXX, is that it refers to Carthage.

[2] Gen. i. 9: 'Let all the waters that are beneath the heaven be gathered into one place, and let the dry land appear.'

[3] For the foundations and columns of heaven, see 2 Sam. xxii. 8, Job xxvi. 11.

[4] Gen. ii. 8, iv. 16; Ezek. xxxi. 8, 9, 16, 18, xxxvi. 35; Isa. li. 3; Joel ii. 3.

16. The plain formed of earth and seas was thought of as finite, and as included within fixed limits, which are frequently mentioned[1]. The earth is firmly fixed in its place: we often hear of its foundations and of its corner-stones[2], by a simile taken from human buildings. Not that these corner points are to be regarded as resting on a base; for on what then would the base rest? They are simply fixed unalterably by the Divine will; and the earth cannot move from them in any respect, except when Yahwe himself shakes them, as happens in an earthquake[3]. The earth then, with its corners fixed, has no need of a base or support outside itself: thus alone can we understand the expression in Psalm cxxxvi that 'the earth is founded on the waters,' and how Job can say (xxvi. 7) that the earth is 'founded upon nothing.' These are simple indications of relative position. The upper part of the earth, as we shall see, stands above the lower waters; all the mass, therefore, of the earth, including these waters, is suspended in space, and consequently rests upon nothing.

17. The terrestrial mass, which supports the continents and seas in its upper part, extends in depth to the lowest part of the universe: to this extension, as has been already said, the Jews gave the name of *tĕhōm*, implying depth. We may conveniently render this by *abyss* (or *deep*). 'Thy judgements are a great abyss,' says the author of Psalm xxxvi to the Lord, meaning to indicate inscrutable profundity. 'Thou

[1] Deut. xxviii. 64; Job xxviii. 24, xxxvii. 3; Jer. x. 13; Ps. ii. 8, lxxii. 8, and many other passages mention the limits of the earth. The limits of the sea are alluded to in Job xxvi. 10, xxxviii. 8–11; Prov. viii. 29; Jer. v. 22.

[2] Out of many passages the following may be cited: 1 Sam. ii. 8; 2 Sam. xxii. 16; Job ix. 6; 1 Chron. xvi. 30; Job xxxviii. 4, 6; Ps. xviii. 15, lxxv. 3, xciii. 1, xcvi. 10, civ. 5; Jer. xxxi. 37; Prov. viii. 29.

[3] The earthquake is mentioned in 1 Kings xix. 11–12; Job ix. 6; Isa. xxix. 6; Ezek. xxxviii. 19; Amos i. 1; Zech. xiv. 5; and elsewhere.

hast brought me again from the abysses of the earth,' says the author of Psalm lxxi to the Lord: that is to say, from the depth of misery. In Psalm cxxxv the abyss is counted as part of the universe: 'Whatsoever the Lord pleased, that did He in heaven, in earth, in the sea, and in all the abysses;' where the enumeration begins with the highest places (heaven), and descends, step by step, to the lowest[1]. But more often the abyss is connected with the idea of the subterranean waters. 'He hath gathered the waters of the sea in one mass, and laid up the abysses in storehouses' (Ps. xxxiii. 7); here the abysses are represented as an immense mass of water. Hence proceed the 'springs of the sea[2],' or the 'fountains of the great abyss[3],' which suggest to us a subterranean hollow full of water, much greater than all the others, whence the waters of the flood burst forth. From this mass of abysmal water also proceed springs and the sources of rivers, which are several times mentioned as among the greatest blessings of a country[4]. This is picturesquely expressed in Psalm xviii: 'Then appeared the springs of waters, and the foundations of the earth were laid bare.' In Proverbs also (viii. 24), the abysses come into relation with springs, where Wisdom is said to have been born, 'when the abysses did not yet exist, nor fountains bubbling with water.'

18. So then, the Jews thought of an immense mass of subterranean waters, which formed, together with the waters of seas and lakes, the system of the 'lower waters,' so called to distinguish them from the 'upper waters,' which were sup-

[1] The abysses are sometimes connected with the bottom of the sea (Job xxxviii. 16); or are simply contrasted as depth with the height of heaven (Ps. cvii. 26).

[2] Job xxxviii. 16. [3] Gen. vii. 11, viii. 2.

[4] See the blessing of Jacob (Gen. xlix. 25), the blessing of Moses (Deut. xxxiii. 13), the description of the promised land (Deut. viii. 7) and of the land of Assyria (Ezek. xxxi. 4).

posed (as will appear later) to stand above the firmament. These subterranean waters partly rose by means of channels and caverns to the dry surface of the earth, producing springs and rivers, partly penetrated to the basin of the seas and lakes, maintaining their level by the aid of apertures and channels at the bottom; so we must understand the expressions, 'springs of the sea,' and 'fountains of the great abyss.' This arrangement, by making a single mass of the superficial and subterranean waters, allowed the Jews to explain how the sea does not overflow with the ceaseless influx of the rivers, and how springs come to be perennial, thus affording a simple reason, ingenious for its time, of the circulation of waters and springs to the sea and of the sea to springs[1]. All the Biblical writers appear to be ignorant of the origin of springs from the condensation of the atmospheric waters. That the lower waters should overcome the laws of natural gravity, and rise again from subterranean depths to the

[1] This problem is propounded in so many words by Ecclesiastes i. 7: 'All the rivers run into the sea, and the sea is not full; unto the place whence they come, thither they return again.' Antonio Stoppani (*Cosmogonia Mosaica*, Cogliati, Milan, 1887, pp. 312–13) takes advantage of this passage to assert that the Jews (Stoppani says Solomon, believing him to be the author of Ecclesiastes) knew of the atmospheric circulation of waters, as it is now taught in all works on meteorology and physics. With all due respect to this learned and eloquent writer, I must say that I cannot see the necessity for such a conclusion. Ecclesiastes merely dwells on the fact that the sea is not increased by the influx of the rivers: hence he concludes that the waters of rivers must return from the sea to their sources. But he gives no clear indication whether this return takes place by the atmosphere or under the earth. That this latter supposition was in the minds of the Biblical writers, results from the sum total of their cosmological ideas, as they are expounded above. As a matter of fact, Albertus Magnus and St. Thomas Aquinas still thought that all the rivers, or at any rate the principal ones, took their origin immediately from the sea, making a path thence under the earth through its pores: see on this subject, Stoppani, *op. cit.* p. 347.

surface, was considered as a result of the omnipotence of God, who 'calls the waters of the sea and spreads them over the surface of the earth[1].'

19. The abyss is not infinite, just as the heaven is not infinite: the abyss embraces the lower part of the universe, and it has its limits like the heaven, earth, and sea[2]. Its depth is in the same class of measureless size as the height of the heaven and the breadth of the earth: it cannot be measured by men[3].

In the lowest part of the abysses is Sheol, the place where those dwell who have passed to the state of *rephaim* or 'shades[4].' This is the place lower than any other[5], which is described in the Book of Job (x. 21–2) as the land where the shadow of death reigns, where the shadows are scarcely broken by any glimmers of twilight, where there is no order, and whence there is no return—in short, as something very like the Hades and Avernus of the Greek and Latin classics, and the Aralu of the Babylonians. No Hebrew Dante has described this place; yet we already find in Ezekiel[6] a part of

[1] Amos v. 8. The analogy between these abysmal waters and the subterranean ocean (*apsu*) of the Babylonians, is evident. See the description of the latter in Jensen, *Kosmologie der Babylonier*, pp. 243–53.

[2] This is required by the fact that allusions occur in the Old Testament to the *circuit* of the sun, moon, and stars: this circuit would be an impossibility if the earth were supposed to be prolonged to infinity. Xenophanes, the Greek philosopher who admitted this prolongation, was obliged to suppose that the stars were luminous meteors, lighted every morning and extinguished every evening. On the other hand, the Bible considers the sun and all the stars as bodies of permanent identity and uninterrupted existence.

[3] Ecclus. i. 3 (LXX), i. 2 (Vulg.).

[4] Ps. lxxxviii. 10; Prov. ii. 18; Isa. xxvi. 14.

[5] Deut. xxxii. 22; Job xi. 8.

[6] Ezek. xxvi. 19–20, xxxi. 14–18, xxxii. 18–32. The word 'pit' (*bôr*) often serves in the Bible to indicate the place of burial: sometimes also it is used for Sheol as a whole. Commentators have therefore usually interpreted it in these senses even when translating the passages cited

Sheol distinguished as deeper, called the 'pit' or 'the lowest parts of the earth,' where the uncircumcised descend and those who have fallen by the sword, causing terror in the land of the living. In course of time this distinction came to be more definite: the upper part of Sheol, destined for the just, was called 'Abraham's bosom,' and the lower part became Gehenna, where sinners were tormented in flames [1].

20. Over the surface of the great circle occupied by the earth and the seas rises the system of the heavens, the kingdom of light, corresponding to the abyss and the kingdom of darkness; first, proceeding upwards, is the heaven called by the special name *rāqīa'*, which the LXX render by στερέωμα, the Vulgate by *firmamentum*, whence the word *firmament* has come into use among ourselves also [2].

Sometimes it is further described as *rĕqīa' hasshamayim*, the firmament of the heavens [3]. It is a vault of great solidity, compared in Job (xxxvii. 18) to a metal mirror; a transparent vault allowing the light of the stars, which are placed higher,

from Ezekiel. But attentive reading will show that the reference is to a place specially destined for the uncircumcised and for men of blood.

[1] Luke xvi. 22–8, in the parable of the rich man and Lazarus. Mention is there made (verse 26) of the great leap which must be made to descend from Abraham's bosom to Gehenna.

[2] The original meaning of *rāqīa'* is not quite clear. Gesenius (*Thes.* p. 1312) translates it by *expansum, idque firmum*, deriving it from the root *rāqa'* (*percussit, tutudit, tundendo expandit*). From this meaning there is derived a second, which the same root *rāqa'* takes in the Syriac language: this may be expressed by *firmavit, stabilivit.* The LXX and Vulgate have certainly followed this view of the meaning. In Ezekiel *rāqīa'* is used to mean a floor or pavement suspended on high (i. 22–6, x. 1). See the able and learned discussion by Stoppani (*op. cit.* pp. 267–81), where the meaning *firmament* appears to be clearly established in opposition to the interpretation *extension* which several modern commentators adopt.

[3] Gen. i. 14, 15, 17, 20. *Rāqīa'* alone in Gen. i. 6, 7, 8; Ps. xix. 1; Dan. xii. 3. In Ecclus. xliii. 8, read στερέωμα.

to pass through. Its main duty is to support 'the upper waters,' holding them suspended on high above the earth, and separated from 'the lower waters' of the continents, seas, and abysses: as we are told in the noble opening of Genesis (i. 7). So it is said in Psalm civ. 3 that God 'has covered the upper part of the heaven with water,' and in Psalm cxlviii. 4 'the waters that are above the heaven' are exhorted to praise God[1].

21. By means of flood-gates or portcullises (*arubboth*) regulated by the hand of Yahwe[2], the upper waters come to be distributed over the earth in the form of rain, subject to rules as to time and place[3]. All are familiar with the account of the flood, in which, to inundate the earth, not only 'all fountains of the great abyss,' but also 'the flood-gates of heaven,' are opened[4]. This curious conception, which has evidently been produced by the desire to explain the phenomenon of rain, is found repeated in Genesis, the Books of Kings, the Psalms, and the Prophets: it does not seem possible to understand it in a metaphorical sense and adapt it to our ideas[5]; it is, in fact, in the closest connexion with the rest of the conception of the upper waters. Considering the spherical and convex shape of the firmament, the upper waters could not remain above without a second wall to hold them in at the sides and the top. So a second vault above the vault of the firmament closes in, together with the firma-

[1] Repeated in the Song of the Three Children: Dan. iii. 60 (Vulg.). According to Jensen (*op. cit.* pp. 254, 344), the conception of the upper waters is also found in the Babylonian cosmology.

[2] Gen. vii. 11, viii. 2; 2 Kings vii. 19; Ps. lxxviii. 3; Isa. xxiv. 18; Mal. iii. 10.

[3] Jer. v. 24; Job xxviii. 26; Deut. xxviii. 12; Lev. xxvi. 3. Two annual rains are distinguished in the Old Testament: the 'former' or autumnal rain (October to December), and the 'latter' or spring rain (March to April). See Deut. xi. 14; Jer. v. 24; Hos. vi. 3.

[4] Gen. vii. 11, viii. 2.

[5] As Gesenius would wish to do (*Thes.* p. 1312).

ment, a space where are the storehouses (*otsaroth*, θησαυροί, *thesauri*) of rain, hail, and snow[1]. They are the ministers either of the goodness or of the wrath of the Almighty[2], and are kept full by His hand, while the water that falls 'returns not on high, but changes into seeds and fruits' for the use of animals and men[3]. In the lower zone of this space, on the level of the lands and seas and round about them, are the 'storehouses of the winds[4],' which open from one side or the other in all the directions of the horizon, and so give rise to the rush of wind.

22. The ancient Jews did not mark more than four directions in their horizon, and did not distinguish more than four winds. The 'four winds of heaven' are alluded to in many passages of the Old Testament[5], so much so that the expression ended by passing into common use among ourselves also. The four directions corresponded, as would naturally be expected, to our cardinal points. For each of them the Jewish writers used three different systems of names, each resting on a separate principle.

In the first system the observer is supposed to be placed facing east, and the directions were defined in relation to him —in front, behind, to his right, to his left. Hence the following terms:—

E., *qedem*, in front.

W., *aḥor*, or *aḥăron*, behind.

N., *sĕmol*, the left, i.e. that which is on his left.

S., *yamin*, or *teman*, the right, i.e. that which is on his right.

This method of distinguishing the parts of the horizon was also used by the Indians and partially by the Arabs.

[1] Job xxxviii. 22. [2] Job xxxvii. 6, 11; xxxviii. 22, 23, 25–7.

[3] Isa. lv. 10. This passage expressly excludes any idea of an atmospheric circulation of waters: see above, note on page 29.

[4] Jer. x. 13, li. 16; Ps. cxxxv. 7.

[5] Jer. xlix. 36; Ezek. xxxvii. 9; Zech. vi. 5; Dan. viii. 8.

From this use, which makes the east into the fundamental direction, is derived in our western languages the expression 'to orientate oneself.'

A second system of names was derived from the appearances associated with the sun's daily motion:—

E. *mizraḥ*, the rising of the sun, east.

W. *mĕbŏ hasshemesh*, the setting of the sun, west.

N. *tsafon*, obscure or dark place.

S. *darom*, bright or illuminated place.

A third system, which might be called topographical, indicated directions by means of local circumstances corresponding to them. According to this principle, the south was very often described by the name *negeb* (derived from the disused root *nagab* = Latin *exsiccatus fuit*), because the region south of Palestine was so called, being a completely arid desert. No less frequently we find the west described by the name *miyyam* (from the sea) or *yammaḥ* (towards the sea); for the sea (*yam*) formed the western boundary of Palestine, and for all the Jews without exception was to be found on the western side. Analogous descriptions for the north and east do not appear to have been in use[1].

The four winds are always indicated by the name of the direction from which they blow, as with us. The Jews attributed special qualities to each wind. The east wind brought them scorching heat and locusts[2]; the south

[1] These three ways of indicating direction are found used promiscuously by the Biblical writers, without any obvious rule of preference. Thus, in Genesis (xiii. 14) God says to Abraham at his calling: 'Lift up thine eyes and look from the place where thou standest, towards *tsafon*, towards *negeb*, towards *qedem*, and towards *yam*': where terms belonging to all three systems are used together. It even happens sometimes that the same direction is indicated by two of its names in combination. Thus, in Exodus (ch. xxvii), the south is called *negeb-teman* and the east *qedem-mizraḥ*.

[2] Gen. xli. 6, xlii. 23; Exod. x. 13; Hos. xiii. 15; Ezek. xvii. 10, xix. 12.

wind storms and warmth[1]; with the west wind came clouds and rain[2]; with the north wind cold and calm[3].

23. As will be seen, this conception of the firmament as distributing winds, rain, snow, and hail, takes away from the clouds their principal function, that of bringing rain. These mount up from the extremity of the earth[4] and spread over the sky: in them Yahwe places his bow, the rainbow[5].

This crude cosmography is not, however, that of all the Biblical writers: it is not that, for example, of the learned and gifted thinker who wrote the Book of Job. In his opinion it is the clouds that contain the rain and distribute it over the earth[6]. This conception removes the part taken by the firmament in the distribution of rains, and the hypothesis of the upper waters is no longer necessary. When the Almighty wishes it to rain, He 'binds the waters in His clouds,' which are charged with spreading them wherever it is ordained. Yet we still hear in Job of 'the storehouses of snow and hail, made ready for the day of enmity and battle' (xxxviii. 22, 23), where these products are clearly distinguished from rain and thunder, which are mentioned a little lower down (xxxviii. 25–8). Accordingly, it is possible that the author reserved the firmament for snow and hail; but it must be confessed that he makes no mention of the firmament, though opportunities for naming it were not wanting.

The evident connexion, however, of clouds with rain could not escape the notice of observers, however superficial,

[1] Job xxxvii. 9, 17; Isa. xxi. 1; Zech. ix. 14; Luke xii. 55.

[2] 1 Kings xviii. 44; Luke xii. 54.

[3] Job xxxvii. 9; Prov. xxv. 23; Ecclus. xliii. 22.

[4] Ps. cxxxv. 7; Jer. x. 13, li. 16.

[5] Gen. ix. 13, 14, 16; Ezek. i. 28.

[6] Job xxvi. 8: 'He bindeth up the waters in His clouds'; and lower down (xxxvi. 27, 28): 'The rain falls from the clouds and is diffused over men.'

and we find some traces of it. The author of Ecclesiastes says (xi. 3): 'When the clouds are full, they spread rain over the earth.' In the second Book of Samuel (xxii. 12), God is described as gathering round about Him 'masses of water and thick clouds,' where the juxtaposition accentuates a connexion between the two things[1]. In the Book of Judges (v. 4), it is said that 'the heavens and the clouds drop water.' And in Genesis (ii. 6), a cloud is made to intervene, to moisten the dust, thus rendering possible the clay for the formation of Adam's body. The connexion of clouds with dew is clearly indicated in Isaiah[2].

24. It must be recognized in general that it is no easy matter to present an exhaustive account of what the Jewish writers say with regard to the cause and manner of operation of meteorological phenomena. As we are dealing with opinions that are derived from the imagination rather than from the critical study of the facts, a certain difference between one author and another is to be expected. It accordingly becomes difficult to distinguish or reconcile

[1] This connexion would be still more clearly marked in the Vulgate rendering: *cribrans aquas de nubibus coelorum*. But no other interpreter comes near this way of understanding it; not even the LXX.

[2] Isa. xviii. 4. The Jews had noticed the spontaneous dissolution of clouds, especially of morning clouds: see Job vii. 9; Hos. vi. 4. But I have found nothing to indicate any knowledge of the formation of clouds by condensation of the atmospheric vapours. One might refer to this fact a passage in the Vulgate (Job xxxvii. 21): *aer cogetur in nubes*. But it is probable that the translator only wished to suggest the clouding of the air as a mere fact of observation, perhaps following the example of Symmachus, who translates *συννεφήσει τὸν αἰθέρα*. There seems already to have been uncertainty as to the reading of this passage in the time of the earliest interpreters. In fact, the LXX have *ὥσπερ τὸ παρ' αὐτοῦ ἐπὶ νεφῶν*, where the air is not even named. The equivalent of the Massoretic text in Latin would be *ventus transiit et illud* (coelum) *purificavit*, nearly the opposite of the sense adopted by Symmachus and the Vulgate. Recent commentators follow the Massoretic reading more or less closely.

such opinions, represented for the most part by a few phrases whose meaning is often not clearly determined, to say nothing of the possibility that we ought to interpret these words, not strictly and literally, but rather in a metaphorical sense, or as similes.

25. We have now exhausted that part of Jewish cosmography which relates to the earth, the abysses, and the firmament. All these taken together must be thought of as forming a cosmic system or body, fashioned in a shape which cannot be exactly and completely determined by the aid of the Biblical data. Yet it may be admitted as very probable that these writers, going by what appearances suggested, would suppose the whole to be symmetrically arranged round a vertical line passing through Jerusalem. We may further admit that, as the heaven forms with the air an upper part, of a round shape, like a vault or circular cupola, as it appears to our eyes, so too the abysses might be symmetrically pictured as included within a surface of equal shape and size, of corresponding convexity, at the bottom. Thus the heaven with the air, on the one side, the abysses with Sheol and the lowest parts of the earth, on the other, would come to form two equal halves, separated by the plane containing the surface of the earth and seas, and symmetrically placed in relation to that plane[1]. Such a cosmic system or body might then perhaps have a spherical shape. Or others might suppose, with some reason, that the whole figure formed a spheroid depressed in the vertical direction, the conception being thus accommodated to the apparent shape of the firmament, which, as any one can see, is not properly a half sphere but rather the half of a spheroid much more extended in a horizontal than in a vertical direction. In the annexed figure, which is designed to render the pre-

[1] An allusion to this symmetrical arrangement might perhaps be found in Job xi. 8 and Psalm cxxxix. 8.

ceding account more clear and aid the reader's imagination, I have drawn the universe as a spheroid depressed in this way. By comparing it with the Biblical data, the reader will easily be able to judge how much foundation of fact there is in it, and how much hypothesis[1].

[1] In Figure 1: ABC = the upper heaven; ADC = the curve of the abyss; AEC = the plane of the earth and seas; SRS = various parts of the sea; EEE = various parts of the earth; GHG = the profile of the firmament or lower heaven; KK = the storehouses of the winds; LL = the storehouses of the upper waters, of snow, and of hail; M = the space occupied by the air, within which the clouds move; NN = the waters of the great abyss; xxx = the fountains of the great abyss; PP = Sheol or limbo; Q = the lower part of the same, the inferno properly so called.

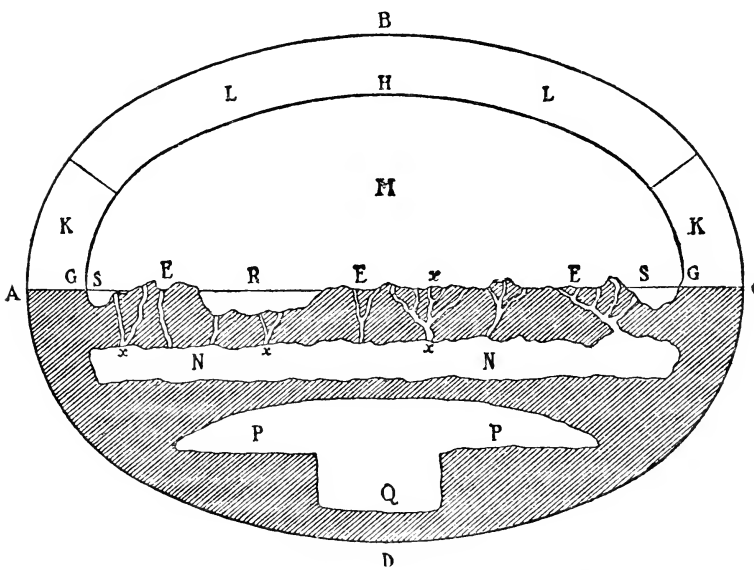


FIG. 1. Heaven, the earth, and the abysses, according to the writers of the Old Testament.

CHAPTER III

THE STARS

The sun and the moon. — Their course stopped by Joshua and others. — Allusions to a total eclipse, probably that of 831 B. C. — The heaven of stars. — The *host of heaven*. — The planets: Venus and Saturn. — Comets and bolides. — Fall of meteorites. — Astrology.

26. ROUND about the cosmic body or system which we have described above, composed of the firmament and of the earth with the abysses, and representing the central and immovable part of the universe, are gathered the stars, and, primarily, the sun and moon, placed, as it seems, at not very different distances from the earth[1]. The sun (*shemesh*) is the most magnificent work of the Almighty: 'he cometh forth as a bridegroom from his nuptial chamber, he rejoiceth as a hero in his victorious course: he ariseth from one end of the heaven, and his circuit reacheth to the other end thereof; nothing is taken away from his heat' (Ps. xix. 5–7). His course continues day and night: 'the sun riseth, the sun goeth down, and anew he hasteneth to the place where he must arise' (Eccles. i. 5). Here the subterranean course of the sun is clearly indicated, from the point of setting to that of his next rising. As regards the moon (called in Hebrew

[1] There cannot be any doubt that the sun and moon were placed above the firmament and the upper waters. When therefore Genesis (i. 14, 15, 17) says that God has placed the lights '*in* the firmament of heaven,' we must understand that it is the appearance rather than the reality that the writer wishes to describe. In fact, for the spectator these lights do project on the vault of the firmament.

yarēaḥ, or poetically *lĕbanah*, the white one), her course could not be supposed to be very different from that of the sun. Moon and sun are continually found associated as two great lights, destined, the one to rule the day, the other the night, intended to fix days, months, and years, and also to serve for the miraculous manifestations portending remarkable events to come[1]. Although their duty of regulating time requires a certain regularity of movements and periods, it is not considered impossible that their course should be arrested or even turned back at the command of Joshua and other men loved by Yahwe. An ancient Jewish poet, singing of Joshua's victory over the Amorites, attributes to that commander the boast of having arrested the sun and moon[2]; and certainly one could not conceive a more effective flight of fancy, or one more fitted for the heights of an heroic and lyrical composition. But as has happened in other ancient nations, so among the Jews also the material of heroic songs passed not infrequently into history, and, as history, this episode in the wars of Israel is even now re-

[1] Gen. i. 14. Such would seem to be the meaning of the word *othoth* (LXX εἰς σημεῖα; Vulg. *in signa*). Further discussion of the various possible interpretations is given in Gesenius, *Thes.* p. 40. Among the *signs* to which Genesis alludes, eclipses are certainly to be included: especially total eclipses, on which see below, §§ 27, 28.

[2] Jos. x. 12, 13: 'Then Joshua spake in the presence of Israel: Sun, stand thou still above Gibeon, and thou moon, in the valley of Aijalon! And the sun stood still and the moon stayed until the people had avenged themselves upon their enemies. Is this not written in the *Book of the Upright*? And the sun stood still in the midst of heaven and hasted not to go down for the space of about a whole day. And there was no day like that, before it or after it.' The *Book of the Upright* or *the Just* (*sepher hayyashar*) seems to have been a collection of songs connected with the heroic deeds and the great men of Israel: as it contained songs by David, its compilation does not date from before his time. The words placed in Joshua's mouth have in the Hebrew a rhythm and poetical colouring, and are to be regarded as a verbal quotation from the *Book of the Just*.

garded by many. According to the narrative in the historical portion of the book bearing the name of Isaiah, that prophet is said not only to have stopped the sun, but to have turned it back[1]. So, too, of Elimelech, husband of Naomi, an obscure tradition relates that he stopped the sun; and according to the Vulgate of 1 Chronicles iv. 22, a descendant of Judah, son of Jacob, is said to have accomplished a like feat[2].

27. Eclipses of the sun and of the moon were not unknown to the Jews. They did not understand their reason, and were wont to regard them as signs announcing Divine chastisements. Nor did the prophets fail to confirm this opinion. In Joel the Lord says[3]: 'I will shew wonders in heaven and earth, blood and fire and columns of smoke: the sun shall be turned into darkness and the moon into blood.' Similarly, Amos (viii. 9): 'And it shall come to pass in that day, saith the Lord God, that I will cause the sun to go down at noon, and I will spread darkness over the earth in the clear day.' These passages seem to hint at events actually witnessed. Total eclipses of the *moon* were always sufficiently common at every time and place: 'the moon turned into blood' may be confidently referred to the livid reddish colour which is often noticed in these eclipses. As regards total eclipses of the *sun*, the inhabitants of Palestine and of the neighbouring regions would have had several opportunities to witness them in the times of Joel and Amos. In the elaborate catalogues of eclipses published by Oppolzer and by Ginzel[4], we find registered as visible in those parts

[1] On this event see §§ 81, 82.

[2] For these two less known cases see Martini's comment on 1 Chron. iv. 22.

[3] Joel iii. 3, 4 (Hebrew) or ii. 30, 31 (English versions).

[4] Oppolzer, *Canon der Finsternisse* (Memoirs of the Viennese Imperial Academy of the Sciences: vol. lii). Ginzel, *Specieller Canon der Sonnen- und Mondfinsternisse für die Länder des klassischen Alterthums, von* 900 *vor Chr. bis* 600 *nach Chr.* (Berlin, 1899).

total solar eclipses under the dates, August 15, 831 B.C.; April 2, 824 B.C.; and June 15, 763 B.C.[1].

28. Other prophets, later than Joel and Amos, seem to allude to total eclipses of sun and moon. Micah (iii. 6): 'The sun shall go down over the prophets, and the day shall be dark round about them.' Isaiah (xiii. 10): 'The sun shall be darkened in his going forth, and the moon shall not shine with her light.' So far as the sun is concerned, probably these are reminiscences taken from earlier prophets;

[1] According to the maps of eclipses appended to the work of Ginzel cited above, the zone of totality of the eclipse of August 15, 831 B.C., passed near Memphis, crossed Arabia Petraea, and fell within the southern boundaries of Palestine. The moment of greatest darkness for southern Judaea and Arabia Petraea would have been almost exactly at midday: just as the Lord says through the mouth of Amos, 'I will make the sun go down at midday.' Ginzel's maps show a smaller probability for the eclipse of 824 B.C., and a still smaller for that of 763 B.C.: first, because these eclipses were not total within the limits of Palestine and the zone of totality kept at some distance from those limits; and also because the greatest darkness occasioned by them in those regions would not have taken place at midday, but, in 824 B.C., two hours before midday, and in 763 B.C., three hours after midday. As to the date of Amos, we know from himself that his vision took place while Uzziah (also called Azariah) was reigning in the kingdom of Judah, and Jeroboam II simultaneously reigning over Israel. According to Oppert's calculations (*Proc. of Soc. Bibl. Arch.* 1898, xx, pp. 45, 46) these two kings reigned contemporaneously from 811 to 773 B.C. So Amos, and Joel too (who is supposed to have been rather earlier than Amos), would have been very well able to be spectators either of the eclipse of 831 or of that of 824, or of both. It should be mentioned, however, that Oppert's chronology, founded in essentials on the data of the Books of Kings, comes into conflict with the Assyrian monuments which are contemporary with the events; according to the monuments, these two reigns should be brought about 25 or 30 years nearer our own time, so that the interval within which the prophecy of Amos falls comes to be put roughly between 780 and 750 B.C. The difference is not such as essentially to change the position of the question. Amos could well have remembered in old age the extraordinary spectacle of a total eclipse seen by him in early youth. For Joel, if he is a little earlier than Amos, the difficulty is still less.

for, from 763 down to the destruction of the first Temple (586 B.C.), no total eclipse of the sun was visible in Palestine or its immediate surroundings. In the Book of Job also (iii. 5) mention is made of a 'darkening of the day,' which may well be understood of a total solar eclipse.

29. Above the course of the sun and the moon, as far as the extreme limit of visible things, there extends the heaven of the stars, sometimes confused with the firmament. But while the firmament is thought of as solid and rigid like a vault, the heaven of the stars is introduced to us as something thin and flexible, like a cloth or curtain. In several places in the prophets[1] God is said to have 'stretched out the heaven,' an expression which it would not seem possible to use of a solid vault. In Ps. civ. 2 'God stretcheth out the heaven like a curtain[2]'; and elsewhere, 'He stretcheth out the heaven like a veil, and spreadeth it out like a tent to dwell in[3].' This idea that the heaven, studded with stars, is something subtile and flexible, bearing the stars fastened on after the

[1] Isa. xliv. 24, xlv. 12, li. 13; Jer. x. 12; Zech. xii. 1.

[2] Interpreters are not agreed as to the true sense of *yerî'ah*, which is translated by 'curtain' above. The LXX have δέρριν, with which the Vulgate is in accord, reading *pellem*. Luther *Teppich* [cloth], Diodati *cortina* [curtain], Philippson *Zeltteppich* [tent-cloth], Reuss *Zeltdecke* [tent-covering: the usual meaning, e.g. Jer. x. 20]. But all have in common the idea of something thin and flexible, designed to serve as a covering.

[3] Isa. xl. 22. Here too what is expressed by 'veil' is represented in the Hebrew by a word of indeterminate sense, *doq*, including the idea of thinness and subtilty Gesenius (*Thes.* p. 348). So the Vulgate goes straight to the extreme limit, saying, *qui extendit velut nihilum coelos*; while Luther contents himself with 'a thin skin,' *ein dünnes Fell*. Diodati has *come una tela* [like a web], Philippson *ein Schleier* [a veil], Reuss *ein Teppich* [a carpet]. The authority of the LXX would appear to stand alone, in speaking of a vault: ὁ στήσας ὡς καμάραν τὸν οὐρανόν. But the word καμάρα can be used of any kind of cover, even of the lightest kind and made of skins or silk. There is an example in Herodotus i. 199, where it stands for the cover of a closed car.

fashion of embroidery, is expressed in the most lively way by the first Isaiah, who predicts as a sign of the divine wrath[1] that 'all the host of heaven shall be dissolved, and the heavens shall be rolled up like a book: and all their host shall sink down, as falleth the leaf of the vine or of a fig-tree.'

30. In the song of Deborah, one of the most ancient monuments of Hebrew literature that have reached us, there is an obvious allusion to the daily motion of the stars (*kokabim*). During the fight at the brook Kishon 'the stars fought from heaven, they fought from their orbits against Sisera[2].' In the Book of Wisdom (vii. 19), Solomon is made to boast of knowing, amongst many other things, ἐνιαυτῶν κύκλους καὶ ἀστέρων θέσεις, *annorum cursus et stellarum dispositiones*. In these last two words we may perhaps recognize an allusion to the constellations; but, if the late date of the book be granted, it would not seem improbable that the astronomical conception of the prevision of celestial movements is here seen in process of arising, or, it may be, even the astrological view of the reciprocal configurations of the seven planets. However this ought to be understood, the power of knowing all the stars, of numbering them, and distinguishing them by their names, is reserved to God alone, who 'counteth the number of the stars, and calleth them all by their names' (Ps. cxlvii. 4)[3]. God alone has full know-

[1] Isa. xxxiv. 4. It is unnecessary to remark that the expression 'to be rolled up like a book' refers to the older form of books, that of a *roll* (Latin *volumen*), rather than to the shape of modern books, to which the Vulgate rendering *complicabuntur* alludes. The meaning of the phrase 'host of heaven' will be discussed a little lower down.

[2] Judg. v. 20. The word *mesilloth*, rendered above by *orbits*, properly means *roads* marked by being raised above the surrounding ground (Latin *via aggesta*), and is to be understood of the ways marked in the sky for the daily course of each star, the *celestial parallels* as we should call them.

[3] See also Isa. xl. 26; Jer. xxxiii. 22; Job ix. 7; Wisdom vii. 19.

ledge of the laws which govern the heaven, and the power of regulating the action which they exercise over the earth (Job xxxviii. 33).

31. If we examine the astronomical knowledge of primitive peoples, we find that certain groups of stars, more clearly defined and more conspicuous than the rest, were more or less known by all. The Great Bear has been marked and named not only by the tribes inhabiting the arctic regions of the earth, but also, so far as is known, by all the peoples of the northern temperate zone. The splendid constellation of Orion with its strikingly characteristic shape, and the group of the Pleiades, crowded densely in such a small space, are found in the cosmography of all the peoples of the torrid zone and of the temperate zones of both hemispheres. Accordingly, we find the Great Bear, Orion, and the Pleiades known among the Jews as well as elsewhere, and a special name assigned to each, which occurs more than once in the Old Testament. It must, however, be confessed that the nomenclature of these groups and, more generally, whatever concerns the uranography of the Hebrews, still causes much perplexity as regards its interpretation. The assured facts are few; the more or less uncertain conjectures are many. Numerous astronomical and philological discussions have taken place, so that there is a good deal to say on the subject. I have therefore thought it advisable to treat it separately and to devote the whole of the following chapter to it.

32. *The host of heaven.* There occurs not infrequently in the Old Testament the expression *tsĕbā hasshamayim*, which the LXX translate by δυνάμεις τοῦ οὐρανοῦ and elsewhere by στρατιὰ τοῦ οὐρανοῦ, the Vulgate by *militia* or *exercitus coeli*. It is not always employed in the same sense. Sometimes it means simply that which forms the equipment of heaven, and, hence, all the stars in general. So in Genesis (ii. 1),

where it is said that 'the heaven and the earth were finished and all their *tsābā*,' we must understand 'all their *equipment*'; whence the LXX have appropriately rendered *tsābā* by κόσμος, and the Vulgate by *ornatus*. In other places it is natural to take *tsĕbā hasshamayim* as expressing in figurative language the whole multitude of stars, which may well be compared to an army or host; so in several places of Isaiah (xl. 26; xxxiv. 4; xlv. 12). But often especially in writers later than Isaiah[1], by the *host of heaven* we have to understand a particular class of stars to which worship was, during a certain period, paid among the Jews.

33. To arrive at a definition of the stars which were included under the *host of heaven* in this last sense, let us first observe that the allusions only begin in connexion with the last kings of Israel, who are accused of having aroused the wrath of God by worshipping the host of heaven, as well as by other forms of impiety[2]. This worship, introduced under the influence of the Assyrian invasion, passed in the times of Ahaz even into the court of Judah, and was only abolished by the pious Josiah[3]. When then, after the destruction of Samaria in 721 B.C. and the deportation of its inhabitants, colonists from Babylon, Cuthah, and Sepharvaim were substituted in their place, the occasion was favourable for star-worship to spread much more widely in Palestine. This first observation is naturally followed by a second, namely, that the *host of heaven* must have been included in that class of stars whose adoration was taught to the Jews by the Assyrians and Babylonians. Now the star-worship of these two nations comprehended, besides the sun and moon, also Venus and the minor planets; there are in all seven stars to whose divinity, as is well known, the great

[1] Deut. iv. 19, xvii. 3; 2 Kings xvii. 16, xxi. 3, 5, xxiii. 4, 5; Jer. viii. 2; Zeph. i. 5; 2 Chron. xxiii. 3, 5.

[2] 2 Kings xvii. 16.

[3] 2 Kings xxiii. 12.

temple of Borsippa (now a ruin bearing the name *Birs Nimroud*) was consecrated by Nebuchadnezzar. Babylonian theology did not, however, confine itself to these. It introduced further as objects of superstitious veneration a quantity of good and malignant spirits connected with particular stars or groups of stars. The battalions composed of these spirits or subordinate divinities were called the *hosts of heaven* by the Babylonians in the same way as the spirits ruling over the earth were called the *hosts of earth*. Nebuchadnezzar, in one of his inscriptions, exalts the god Nebo by saying that he 'rules over the hosts of heaven and of earth[1].' Similarly, in a hymn to Marduk (the Merodach of the Bible), 'the angels of the hosts of heaven and earth' are said to belong to Marduk[2].

34. A noteworthy illustration relating to the host of heaven is found in 1 Kings (xxii. 19), repeated *verbatim* in 2 Chronicles (xviii. 18). According to this narrative, when Ahab, king of Israel, and Jehoshaphat, king of Judah, wished to make war with united forces against Ramoth-Gilead, a prophet was consulted as to the issue of this expedition, who began his reply by saying, 'I have seen the Lord sitting on a throne and *all the host of heaven* stood by him on the right and on the left.' From what follows it appears that the reference is to a kind of council composed of good and malignant spirits (*ruḥoth*), who are ministers for executing the works of God. The influence of the Babylonian theology on the ideas of the narrator is here perfectly manifest, and no doubt can remain as to the nature of the beings which were supposed to form the *host of heaven*[3]. They were major or

[1] Schrader, *KAT.*[2] p. 413.

[2] Smith's *Chaldean Genesis* (ed. Sayce, 1880), p. 81. The word 'host' is represented in Assyrian by *kiššat*, which others translate by *ensemble* or *totality*.

[3] We must return later to the 'host of heaven' and to the figurative representations of it possessed by the Babylonians: see §§ 72, 73.

minor divinities of the Babylonian Pantheon, or else merely good or bad spirits; to each of these were assigned, as home or as place of rule, so many stars or groups of stars.

35. Of the planets considered singly, two only can be traced in the Old Testament. One of the great prophets of the exile, whose predictions are now found mingled with those of Isaiah, when exulting over the imminent ruin of the Babylonian Empire, breaks into the following words[1]: 'How art thou fallen from heaven, O *Hêlel*, child of the morning, and cut down to the ground, O thou trampler of nations!' The word *hêlel* takes its root from *halal*, which can be interpreted *luxit, splenduit, gloriatus est*; hence it may easily be understood of a star; all the more that, besides the sun and moon, only stars can 'fall from heaven.' Accordingly, the star 'child of the morning' may appropriately be referred to Venus, the morning star. The LXX and the Vulgate have understood it so[2]. As we shall have occasion to show lower down, the two appearances of Venus in the morning and evening were probably thought of by the Jews as two different stars with the name *mazzaroth* (§§ 71–3). An allusion to Venus might conjecturally be recognized in the 'morning stars' mentioned in Job (xxxviii. 7)[3].

The Hebrew name of another planet may with great probability be recognized in Amos (v. 26). This name is read as *Kiyun* according to the Massoretic pointing, but it has now been proved that we ought to point so as to

[1] Isa. xiv. 12.

[2] Similarly, in Assyrio-Babylonian, the planet Venus is sometimes designated *Mustêlil* (splendens), from the root *êlil* (splenduit). See Schrader, *KAT*[2], p. 388.

[3] In the LXX and the Vulgate other passages occur in which Lucifer or Vesper are named, but, when examined in comparison with the Hebrew text, they leave an element of doubt. In some of them the expressions are to be understood simply of the dawn or the morning light. So in Job xi. 17 and Ps. cx. 3.

read *Kaivan*, as the Syriac translator has done[1]. Now *Kaivan* was the name of Saturn among the ancient Arabs and Syrians, and (as E. Schrader has recently proved) among the Assyrians too[2]. The words of Amos are these: 'And ye shall take Sakkuth your king and *Kaivan*, the star of your God, images which ye have made for yourselves.' The prophet, therefore, reproves the Jews for the worship of the planet Saturn.

This exhausts the number of the planets, any notice of which can be found in the Old Testament. For it is not certain that the names *Gad* and *Meni*, which are found in the book ascribed to Isaiah[3], represent the planets Jupiter and Venus. They seem here to stand for the god of fortune and the goddess of chance or fate[4], and their relationship to the planetary deities of Babylonia has not yet been convincingly proved[5].

[1] On this see Gesenius, *Thes.* p. 669, where some other interpretations are given, including that of St. Jerome, *Kîyun* = Lucifer. The pointing which gives *Kaivan* has also been relied upon by the LXX, who transcribe it as Ῥαιφάν, where the initial P instead of K was probably already found by the translators in the Hebrew manuscript which they employed. As a matter of fact, in the Phoenician alphabet (used by the Jews down to the time of the LXX and still later) the letters *caph* and *resh* can easily be interchanged.

[2] Schrader, *KAT.*[2] pp. 442–3. In the sacred books of the Parsees the planet Saturn is named *Kêvan*. See Bundahish, ch. v.

[3] Isa. lxv. 11.

[4] See the discussion of Gesenius, *Thes.* pp. 264, 798. The LXX have τῷ δαιμονίῳ, τῇ τύχῃ. The Vulgate, *qui ponitis fortunae mensam et libatis super eam*, combine the two divinities into one.

[5] The author does not wish to imply that the Jews had not some more exact knowledge of the planets, especially after they had come into contact with the Babylonians. It does not, however, seem that the frequent use of the number 7 in the Old Testament is in any way connected with the planets, much less the institution of the Jewish week (as will be shown in the last chapter of this book). The question regarding the application made of the number 7 in the books of post-Biblical Hebraism is more complicated, since the influence of foreign ideas is frequently evident in them.

36. Had the Jews also paid attention to comets? It seems probable that they had: when Joel[1] makes the Almighty say that He 'will give blood and fire and pillars of smoke,' it is possible that he alludes to comets, though such a description might fit some exceptional meteor such as we usually call bolides. The 'pillars of smoke' must in either case be understood of streaks or trains of luminous vapour. The appearance of a bolide is undoubtedly described in vivid colours in Genesis (xv. 17), where it is said of a sacrifice made by Abram that 'when the sun went down and darkness had become dense, behold, there appeared as it were a smoking brazier and a lamp of fire, which passed across, between the parts of the victims.' A reminiscence of a bolide might also be found in a description given by Ezekiel (i. 4).

An abundant fall of meteoric stones has seemed to some to be alluded to in Joshua (x. 11), as having happened on the day which saw the sun's course stopped. 'And it came to pass that, while they (the enemy) fled from before Israel and they were by the descent of Beth-horon, the Lord cast upon them great stones from heaven unto Azekah, so that more of them died beneath the hailstones than by the sword of the children of Israel.' The mention of 'hailstones' raises a doubt whether the reference is to meteorites and not rather to a hailstorm, which, according to Job (xxxviii. 22, 23), God has stored up 'for the time of enmity and for the days of war and battle.'

37. What arrangement of all the heavenly bodies ought we to believe that the learned among the Jews had made in their minds, and what scheme of their respective distances? We have already seen that the *firmament*, which kept in the upper waters and was designed for the distribution of rain and also to serve as storehouse for snow and hail, was con-

[1] Joel iii. 3 (English versions, ii. 30).

sidered by some writers as a complement of the terrestrial edifice, a sort of *lower, meteorological heaven.* Above it revolved the *upper, astronomical heaven* with its daily motion: within the latter revolved the sun and moon with separate motions of their own. This highest heaven surrounds the earth and the firmament on every side, and above it is the seat of the Almighty. In some places in the Bible there occurs the expression *shĕmē hasshamayim* ('heaven of heavens')[1], which implies an intensification of the idea of heaven, such as is found also in the case of other ideas in Hebrew idiom[2]. The heaven of heavens is not really different from the highest part of heaven, that which encloses the whole universe[3].

38. It is not impossible that, together with a certain notion of astronomy, the Assyrians and Babylonians also imported into Palestine the bad seed of astrology. The Jews, who in the debased periods of the kingdoms of Israel and Judah abandoned themselves to the most senseless and savage superstitions, practised divination of every kind[4], consecrated horses to the sun, adored the host of heaven, and sacrificed their children in Tophet, could not have remained entirely free from astrological superstition, which

[1] Deut. x. 14; 1 Kings viii. 27; Ps. cxlviii. 4; 2 Chron. ii. 5, vi. 18; Neh. ix. 6.

[2] Thus, *dor dorim* (generation of generations) means an exceedingly long time: *hăbel hăbalim* (vanity of vanities) means the extreme of vanity.

[3] It is worthy of note that the ancient Iranians also supposed that two heavens existed: one exterior heaven (*twâsha*), continually in rotation, in which the stars are fixed; one interior (*âsman*), composed of transparent blue material, which represents the firmament of the Bible. See Spiegel, *Eranische Alterthumskunde*, i. pp. 188-9; ii. p. 13; ii. p. 109. Neither the three nor the seven heavens of later Judaism and of the New Testament are anywhere mentioned in the Old Testament: their Babylonian origin may be regarded as certain.

[4] 2 Kings xxiii. 5.

is less absurd and less abominable than so many others. Yet these were aberrations of a temporary character, and it is no small honour for this nation to have been wise enough to see the inanity of this and all other forms of divination. The great prophet of the exile[1] sarcastically reproaches the Babylonians for having faith in the 'dividers of heaven' (that is, the astrologers), and seeking to read the future in the stars; while Jeremiah (x. 2) exclaims: 'Fear not the signs of heaven, at which the heathen are dismayed.' Subsequent history shows that these warnings had their effect. Of what other ancient civilized nation could as much be said?

[1] Isa. xlvii. 13.

NAMES OF STARS IN THE ANCIENT VERSIONS *.

Reference	*Hebrew*	*Targum*	*Peshiṭta*	*LXX*	*Hexapla* (Field)	*Old Latin*	*Vulgate*
Am. v. 8	kīmah	kīmā	kīmā	—	Aq. Ἀρκτοῦρος Sy. Πλειάδες Th. Πλειάς	—	Arcturus
	kesīl	kesīlā	ʿiyūthā	—	Aq. Ὠρίων Sy. ἄστρα Th. Ἔσπερος	—	Orion
Is. xiii. 10	kesīlēhem	nefīlēhōn (*their giants*) [Gen. vi. 4 (R.V.)]	ḥailawathehōn (*their hosts*)	Ὠρίων	Sy. τὰ ἄστρα αὐτῶν	omnia luminaria eius	splendor earum [Hier. ap. Field: Hebraeus, quo ego praeceptore usus sum, *Arcturum* interpretatus est.]
Job ix. 9	ʿash	ʿash	ʿiyūthā	Ἀρκτοῦρος[3]		Arcturus (*Septentrio*[3])	Arcturus[1]
	kesīl	niflā (*giant*)	gabbarā (*strong man*)	Ἔσπερος[2]		Vespertinus (*Vesperus*[2])	Orion[2]
	kīmah	kīmā	kīmā	Πλειάς[1]		Pleiades (*Vergiliae*[1])	Hyades[3]
	ḥadrē thēman	idderōnē shiṭrē mazzalayyā hisetar darōmā (*planet-chambers of the south*)	ḥedar ʿal taimnā	ταμεῖα Νότου	Ὁ Ἑβραῖος· πάντα τὰ ἄστρα τὰ κυκλοῦντα Νότον	interiora Austri (*Austri ministerium*)	interiora Austri
Job xxxvii. 9	ḥeder	idderōn ʿilā (*upper chamber*)	tauwanē	ταμεῖα		promptuaria	interiora
	mezarīm	kawwat mezarīm (*window of Mezarim*)	zariftā (*pouring rain*) [so too the Arabic version of Saʿadya.]	[Ἀρκτοῦρος]	Aq. Μαζούρ Th. ἀκρωτήρια	*promptuaria* (= mezawîm: which is adopted by Budde as the original reading: see Ps. cxliv. 13)	Arcturus
Job xxxviii. 31	kīmah	kīmethā	kīmā	Πλειάς	Aq. (or Sy. ?) as in LXX	Pleias	Pleiades
	kesīl	niflā	gabbarā	Ὠρίων		Orion	Arcturus
Job xxxviii. 32	mazzarōth	shiṭrē mazzalayyā (*paths of the planets*)	ʿagaltā (*carriage*)	Μαζουρώθ	Sy. τὰ σκορπισθέντα Th. = LXX	Mazuroth	Lucifer
	ʿayish	zagethā (= Pleiades)	ʿiyūthā	Ἔσπερος		Vesper	Vesper
2 Kings xxiii. 5	mazzalōth	mazzelathā	mauzclathā	Μαζουρώθ, Μαζαλώθ (Scholiast, ζῴδια)		—	duodecim signa

* This table is adapted from that given in the German translation of Professor Schiaparelli's work, by kind permission of the translator, Dr. Willy Lüdtke, and of the publishers (J. Rickersche Verlagsbuchhandlung, Giessen).

[1] [2] [3] These numbers indicate the order in which the three names follow one another in the LXX, Old Latin, and Vulgate respectively. It is impossible to be absolutely certain to which Hebrew word they severally correspond. The names given in brackets under the Old Latin are from the quotation in S. Ambrose, *De interpellatione Job et David*, I. p. 629 D.

CHAPTER IV

THE CONSTELLATIONS

Difficulty of the subject. — *'Ash* (or *'Ayish*), and her children. — *Kesīl* and *Kesīlim*.—*Kīmah*.—The *chambers of the south*.—*Mezarim*.—The serpent? — *Rahab*.

39. THE investigation of Jewish uranography has to be undertaken with the aid of only a few notices in the Old Testament; and those few are for the most part very doubtful. All the available sources are reduced to three passages in the Book of Job and one in Amos, where the names are given of some of the most striking constellations in the sky. But the identification of these names with constellations now known to us, cannot be built upon any safe basis of fact. One might think that the so-called 'Seventy,' who translated into Greek the books of the Old Testament at a date only two or three centuries later than that of Ezra, and possessed the advantage of writing when a sufficiently fresh oral tradition was still flourishing, must have known the meaning of these names much better than the moderns, who are guided only by more or less probable hypotheses. But it can easily be shown that this meaning had already been lost for them in the larger number of cases. Where Amos (v. 8) says of God: 'He made Kīmah and Kesīl,' the Hellenistic translator wrote *ὁ ποιῶν πάντα καὶ μετασκευάζων*, thus avoiding translating the words Kīmah and Kesīl, of which he probably did not know the precise signification. But another of the Seventy, whose

task was to translate the Book of Job, understood that they related to stars; twice (ix. 9 and xxxviii. 31) he identifies Kīmah with the Pleiades; Kesīl he once identifies with Hesper (ix. 9), once with Orion (xxxviii. 31). The same uncertainties and contradictions are found in the Vulgate: in Kīmah this version recognizes Arcturus in Amos v. 8, the Hyades in Job ix. 9, and the Pleiades in Job xxxviii. 31. Under these circumstances, it is not surprising that some scholars (for example, F. Delitzsch) regard the interpretations hitherto given to the names of the Biblical constellations as subject to complete doubt, and express the hope that assistance in these doubts may come later from the study of the numerous names of stars already found on the Assyrio-Babylonian monuments[1]. In the face of such authoritative declarations, no other course is open for the present except to set out honestly and impartially the position of the question by passing successively in review the names presented.

40. I. *'Ash* and *'Ayish*. Both these names occur in the Book of Job, the first in ix. 9, the second in xxxviii. 32. In both places they are accompanied by the names of other constellations, so that no doubt can arise as to the nature of the thing to which these names correspond. The identity of signification of the two is admitted by many, because, when account is taken of the uncertainty of the vowels in the old Hebrew way of writing, the difference between them

[1] F. Delitzsch, *Das Buch Hiob* (Leipzig, 1902), Commentary, p. 169. This hope does not seem likely to meet with a speedy confirmation. We already possess voluminous researches by learned assyriologists on the constellations named on the cuneiform inscriptions; but the discordance of the results does not inspire much confidence in the security of the interpretations. A sample of these differences may be seen in Ginzel's article summing the matter up (*Die astronomischen Kenntnisse der Babylonier und ihre kulturhistorische Bedeutung;* in C. F. Lehmann's collection, *Beiträge zur alten Geschichte*, vol. i. pp. 3–24).

may seem not very important; it is even believed that they are only two divergent ways of writing the same word[1]. The word itself seems at first sight to throw little light on the meaning. It is used in the Old Testament under the form *'ash* to mean a moth (LXX σής, Vulg. *tinea*). We learn something more from the second of the two passages cited (xxxviii. 32: 'Dost thou guide *'Ayish* and her children'?), where it is, however, doubtful whether the word children is to be understood in a literal or in a metaphorical sense. The opinion most generally received is that of the famous Aben Ezra[2], according to whom *'Ash* or *'Ayish* is nothing else than the Great Bear. Both these names are, it is pointed out, not very different from the name *na'sh* (in Arabic a bier, or a portable litter), which has been used by the Arabs from time immemorial to designate particularly the four stars α, β, γ, δ of the well-known quadrilateral of the Great Bear, or the four wheels of the Wain[3]. Further, this quadrilateral would, by the Arabs living along the Persian Gulf, and by the Jews of Sana and Baghdad, be called simply *'ash*[4]. But the constellation of the Great Bear also includes, besides the quadrilateral α, β, γ, δ called *na'sh* by the Arabs, the three stars ε, ζ, η, which form for us the tail of the Bear and the pole of the Wain. Now these same Arabs have given to these three stars the name *benāt na'sh*, which is equivalent to 'daughters of the *na'sh*.' This at once

[1] On the conditions of vocalization under which the difference of the two names can be reduced to that between the *scriptio plena* and the *scriptio defectiva* of the same word, see F. Delitzsch, *Das Buch Hiob*, Commentary, p. 144. He inclines to believe that *'esh* should be read in both cases.

[2] Ideler, *Untersuchungen über die Sternnamen*, p. 21.

[3] Kazwini (in Ideler, *op. cit.* p. 19). Alsufi, *Description des étoiles fixes* (translated by Schjellerup), pp. 49–50.

[4] Karsten Niebuhr, *Beschreibung von Arabien*, p. 115. Ideler, *op. cit.* p. 22. Gesenius, *Thes.* p. 896.

recalls to the mind the 'children of *'Ayish*,' named in Job xxxviii. 32. And this parallelism is certainly worthy of notice.

41. Not much light on the question can be derived from the most ancient versions. In the LXX rendering of Job ix. 9, it is uncertain which of the three names corresponds to the *'Ash* of the Hebrew text[1]; in Job xxxviii. 32, *'Ayish* corresponds to Ἕσπερον. The Vulgate has, in the former place *Arcturum* for *'Ash* and in the latter *Vesperum* for *'Ayish*. The identification with Vesper seems incredible: for what would in that case be the children of Vesper? But supposing (as is likely) that *Arcturum* is written by mistake for *Arcton*[2], we should have, at any rate in one of the renderings adopted by the Vulgate, a confirmation of the opinion of Aben Ezra.

The ancient Syriac version of the Bible (called the *Peshiṭta*) puts *'Iyutha* in both places of Job, for *'Ash* and *'Ayish*. *'Iyutha* is a constellation known to the Syrians, mention of which is found in the works of St. Ephrem Syrus and of other writers of his nation. It has been supposed by several Oriental scholars[3] that *'Iyutha* is to be identified with the bright star of Auriga, the αἴξ of the Greeks, called by us by the Latin name *Capella*. Hence Hyde and Ewald have believed that the *'Ayish* of Job is also to be taken as equivalent to *Capella*. Then the children of *'Ayish* named by Job would be the small stars near *Capella*, ζ and η of

[1] The names of the Hebrew text in Job ix. 9 are *'ash*, *kesīl*, *kīmah*, in this order: similarly the names of the LXX in order are Πλειάδα, Ἕσπερον, Ἀρκτοῦρον. Now it is probable that *kīmah* corresponds to the Pleiades, as we shall prove shortly. This raises a doubt whether the order of names has been interchanged in the LXX of Job ix. 9; it would not, therefore, be prudent to make use of this passage in the present argument.

[2] On a possible interchange of *Arcturus* and *Arctos*, see below, § 52.

[3] Gesenius, *Thesaurus*, pp. 895–6.

Auriga, called by the Greeks in antiquity, and also by ourselves to-day, the *kids*.

The weak point of this conclusion consists in *'Iyutha* and *Capella* being regarded as identical. But it can be shown that this identity does not exist, and that the Syrians meant by their *'Iyutha* the Head of the celestial Bull, called by the Greeks and by us the Hyades[1]. It is a most remarkable group, composed of a great red star of the first magnitude (the Eye of the Bull, or *Aldebaran*) and of five stars of the fourth magnitude (the minor Hyades), accompanied by several other less visible stars; the whole being exactly similar in shape to our letter V, or to the Greek Λ (see fig. 2).

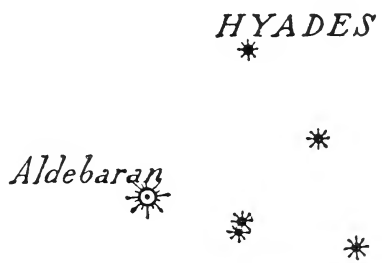


FIG. 2. The Head of the Bull, or the Hyades.

The true conclusion is, that according to the testimony of the Peshiṭta, both *'Ash* and *'Ayish* are to be identified with the star *Aldebaran*, and the children of *'Ayish* with the surrounding minor Hyades.

42. As regards the form *'Ash*, the preceding results receive additional confirmation in another way. It is asserted in the Talmud, on the authority of Rabbi Jehuda (second century), that *'Ash* is the same as *'Iyutha*[2]. Attention should also be

[1] The proof of this affirmation is given in the Appendix at the end of the book (page 161).

[2] Tract. *Berakhoth*, page 58 b: 'Quid est *'ash*? dixit Rab Jehuda,

paid to the fact that the name *'ash* is several times used in the Old Testament to mean the moth, an insect which seems to have been as destructive in ancient Palestine as it is amongst ourselves. In the larva-state it has no special characteristics, but it is more easy to recognize in the butterfly stage. When it is at rest, its wings are not held detached from the body, as happens with most other butterflies, but spread themselves over it in such a way as to form a cloak, more or less similar (according to the several species into which the animal can be divided) to an isosceles triangle. Now the Hyades are arranged so as to form just such a triangle, as can be seen from the representation of their shape in fig. 2 above. It seems to me possible to explain in this way how the Israelites might have given to the constellation of the Hyades the name of the moth. The resemblance in this case is not less than in the case of the seven Triones, which the Greeks compared to a Bear. For all these reasons it becomes fairly probable that *'Ash* should be identified with the Hyades.

43. The same arguments might now be adopted, and with the same result, for the form *'Ayish*, if its identity with *'Ash* could be considered absolutely certain. The Syriac translator in the Peshiṭta, Aben Ezra, and many recent writers, have accepted this identity. If we adopt it, this is equivalent to supposing that *'Ayish* is Aldebaran and that the 'children of *'Ayish*' are the minor Hyades which surround Aldebaran. But it is necessary to remark that the identity is not admitted by all Hebraists. Accordingly, as we have explained the consequences which follow from adopting it, we ought not to fail to mention the consequences of denying it. So then, if we assume it to be certain that *'Ayish* is different from *'Ash*,

Yutha. Quid est *Yutha*? Dicebant ipsi, Cauda Arietis. Alii dicebant ipsi, Caput Tauri.' The translation is that of Buxtorf, *Lex. Chald. Talm. atque Rabb.* p. 1677 [ed. 1875, p. 834]. On *Cauda Arietis* as an equivalent of *'Iyutha*, see Appendix, page 161.

we shall have only one indication to assist us in determining its meaning: that given in the text of Job xxxviii. 32, where Job is asked whether he can 'guide *'Ayish* and her children?' This expression, when used to represent a group of stars, will be most easily and naturally interpreted, if *'Ayish* is taken to be a brilliant star, and if by the 'children of *'Ayish*' we understand a certain number of smaller stars crowded round it in such a way as to form with it a conspicuous group, capable of arresting the attention even of unpractised observers. Of such groups, the Hyades and the Pleiades are certainly the most noteworthy in the sky. By our present hypothesis, the Hyades have to be excluded. As regards the Pleiades, popular imagination compares them to a hen surrounded by her chickens, and this simile might lead us to see in them ''*Ayish* and her children.' But the true Hebrew name for the Pleiades seems to be *Kīmah*, as will be shown below. Accordingly, we shall have to search for *'Ayish* in some one of the other and less obvious groups in the sky, such as are, for example, those which we see formed round the principal star of the Eagle, of the Lyre, or of the Scorpion. In this case, however, we are left absolutely without any criterion for judging to which of these groups the preference should be given.

We alluded above to an opinion which would identify *'Ayish* with *Capella*, and we remarked at the same time that the argument on which it is sought to base this demonstration is fallacious. Yet this does not prove the opinion itself to be wrong; for anything that we know, it might still be permissible to recognize in *Capella and her kids* a picture like that of ''*Ayish* and her children,' and if any one considered this resemblance to be a sign of probable identity, he would be hard to refute. On this subject, however, it may be observed that, in the παραπήγματα or astro-meteorological calendars of the Greeks, the small stars of the kids with their

heliacal rising announced a time of storm. This is the sole reason for their importance; for any one who observes these stars will easily see that they do not form a noteworthy group along with *Capella*, and that there are many other groups in the sky which are equally striking or more so. And it is probable that they were called the *kids* because they are not far (about 6 degrees) from *Capella*, which served to render them easier to find, as their own light is very faint. If this group, which is suggested more by convention than by nature, really represented ''*Ayish* and her children,' we might draw as a necessary conclusion that the Greeks and the Jews received this idea from a common source, perhaps from the Syrians or the Phoenicians. And then the question might be propounded whether we must accept as effects of pure chance the assonances existing between the words αἴξ and *'ayish* on the one side and between Ὑάδες and *'Iyutha* on the other. But it will be hard to arrive at certain results on a subject such as this; and it will be better to confess that *'Ayish*, if considered to be something different from *'Ash*, still remains for us an obscure riddle[1].

44. II. *Kesīl* is named along with other constellations twice in Job (ix. 9 and xxxviii. 31) and once in Amos (v. 8). The name in Hebrew generally means *foolish*; in this sense it is often used in the Bible, and frequently implies also the sense of impiety. In the second of the passages cited above there is a reference to its chains: 'Canst thou loose the bands of Orion?' This seems to suggest that, in consequence of some tradition which is unknown to us, the Jews saw in the constellation *Kesīl* the form of a man chained for his folly or his impiety. Out of the most brilliant constellations in the sky there is one, and one only, the form of which agrees with such a picture: the suggestion is exactly adapted to the

[1] [See also Appendix, page 167.]

case of Orion (as the Greeks call it; *al-gebbar* or 'the giant' of the Arabs; the *Sahu* of the Egyptians; the *Trisanku* of the old Indian myths), which presents to our view, in seven stars of the first and second degrees of magnitude, a coarse figure, evidently that of a man of colossal size. The identity of the constellation *Kesīl* with our Orion is further attested by the tradition of the ancient versions: of the LXX in Job xxxviii. 31, and of the Vulgate in Job ix. 9 and Amos v. 8. Similarly the Peshiṭta in Job ix. 9 and xxxviii. 31 gives *gabbara* ('a strong man'), which is the Syriac name for Orion, closely related to the Arabic *gebbar*. Practically all the more recent interpreters of the Bible agree in admitting this identity. Yet discordant voices are not wanting: thus, Karsten Niebuhr wished to identify *Kesīl* with Sirius; Hyde, with Canopus[1]. The LXX in Job ix. 9 have recognized it as Hesper, and the Vulgate in Job xxxviii. 31 as Arcturus, meaning probably the Bear.

45. The name *Kesīl* is found in the plural in the following passage of the Book of Isaiah (xiii. 10): 'The stars of heaven and their *kesīlim* shall not shine.' The LXX take no account of the plural, writing: οἱ γὰρ ἀστέρες τοῦ οὐρανοῦ καὶ ὁ Ὡρίων. Luther does the same. Reuss renders literally: *Die Sterne am Himmel und seine Orione* ('the stars in heaven and its *Orions*'), a version similar to that proposed by Gesenius[2]. The Vulgate has: *stellae coeli et splendor earum.* Diodati: *le stelle dei cieli, e gli astri di quelli* ('the stars of the heavens and the celestial bodies'). The version of Philippson pleases me more than any other; he sees in 'the *kesīlim* of heaven' the forms of its constellations: *die Sterne des Himmels und ihre Bilder strahlen ihr Licht nicht* ('the stars of heaven and their images do not emit their light'). Even so, however, a double application of the same idea is not altogether avoided.

[1] Ideler, *Sternnamen*, p. 264.

[2] Gesenius, *Thes.* p. 701.

46. III. *Kīmah.* This name occurs, together with that of other constellations, twice in Job (ix. 9 and xxxviii. 31) and once in Amos (v. 8). It may be connected with the Arabic root *kum* (meaning *accumulavit*), or with the Assyrian *kamu* (meaning *ligavit*)[1]: whence it might be concluded that it refers to a cluster of stars closely packed together. Here 'the chains of Kīmah' (Job xxxviii. 31) must be understood in a metaphorical sense. And if that is so, it can refer to no other cluster than that of the Pleiades, which is the best known of these clusters and also the only one which has in consequence of its conspicuous light awakened universal attention at every time and among all peoples. This inference, which would not perhaps have much force in itself, is fortunately confirmed by the tradition of the LXX, where *kīmah*, keeping the singular number, is always *the Pleiad.* In this case there is further to be added the authority, by no means a despicable one, of Aquila of Pontus, who in Job xxxviii. 31 also translates by *the Pleiad.* The example of the LXX and Aquila has been followed almost without exception by later interpreters, including E. Renan and F. Delitzsch. I say *almost* without exception, because the Vulgate in each of the three texts containing the word *kīmah*, has given a different rendering: in one the Hyades, in another the Pleiades, in the third Arcturus. Albert Schultens, a celebrated commentator on Job (1737), seems also to have a different opinion from the ordinary one and to consider *kīmah* as denoting the most brilliant stars of the southern heavens in general[2].

[1] This last derivation has been proposed by F. Delitzsch (*Proc. Soc. Bibl. Archaeol.* xii. p. 185).

[2] Ideler, *Sternnamen*, p. 148. In connexion with *kīmah* mention must be made of the two different interpretations given of the passage concerning it in Job xxxviii. 31. The first part of this verse is understood by most in the sense, 'Hast thou bound the chains of the Pleiades?' where 'the chains' represent the Hebrew *ma'anaddoth.* The authors of

47. IV. *Ḥadrē theman.* In the Book of Job (ix. 9), all the constellations hitherto described are named, and also another bearing the name given at the head of this paragraph. The LXX translate it ταμεῖα Νότου, the Vulgate *interiora Austri*; and these versions render well the literal sense of the word. As a matter of fact, *ḥeder* is derived from the root *ḥadar*, which means in Arabic *latuit*. It denotes properly the inmost and most strongly defended portion of a dwelling, where the articles of greatest value are kept, *penetralia*; it is also used in a metaphorical sense to indicate the most internal and most secluded part of anything. As for *theman*, it means the right side, and, for the Jews, who took their bearings while turning their faces to the east, it meant further the south side and the south wind. Combining these significations with the fact that the reference here is undoubtedly to constellations in the sky, Luther has translated

the most ancient versions (the LXX, Aquila, and the Vulgate) have read it so in their copies. But the fact is that in the present Massoretic text the same word, with the transposition of the letters *n*, *d*, is written *ma'adannoth*, which means *deliciae*, *oblectamenta*, *cupediae* (Gesenius, *Thes.* pp. 995–6). Those interpreters who have wished to adhere to this reading have had to be content with simply transcribing the word without looking for a meaning in it, as Diodati has done, rendering: *Puoi tu legare le delizie delle Gallinelle?* ('Canst thou bind the delights of the Pleiades?') Or else they have had to admit a very free translation, as we see done in the English Authorized Version, 'Canst thou bind the sweet influences of Pleiades?' [R.V. has: 'the cluster of the Pleiades,' giving 'chain' and 'sweet influences' as alternatives in the margin.] In these 'sweet influences' which the Pleiades are supposed to exercise, the celebrated meteorologist Maury (*Sailing Directions*, Washington, 1858, vol. i. p. 17) has recognized nothing less than universal attraction and the constitution of the starry universe as conceived in the hypothesis of Maedler, which made the Pleiades the centre of all the movements of the stars. The baselessness of this hypothesis is now recognized by all astronomers. We have here, however, a new example of the singular aberrations to which men can be led (and to which they have more than once actually been led) by the desire of finding in the Bible what cannot possibly be there.

ḥadrē theman by *die Sterne gegen Mittag* ('the stars towards the south'), Diodati by *i segni che sono in fondo all' Austro* ('the signs that are in the depths at the south'): both are, in my judgement, excellent renderings. The author of the Book of Job has unquestionably wished to indicate some brilliant constellation among the most southerly ones in his horizon. The search for such a constellation would not be difficult if during the interval between the writer's time and our own the fact of precession had not intervened; as a result of precession, many southerly stars which were visible in Palestine (that is to say, about the thirty-second degree of north latitude) when the Book of Job was written, would be now no longer visible at the same latitude, or *vice versa*. Before all, then, it will be necessary to gain a sufficiently exact picture of the southern heavens in the year 750 B.C., which we may suppose to represent the date of the Book of Job. On this date, as is well known, students of Hebrew literature have not yet been able to come to an agreement[1]; fortunately for us, three or four centuries more or less do not essentially change the conditions of the problem.

48. On a globe representing with some accuracy the actual state of the starry heavens, take a point whose right ascension is 17° and south declination 75°. This point will indicate approximately the position which the antarctic pole occupied among the stars in the year 750 B.C. From the same point as pole, take an aperture of the compasses which embraces on the globe 32° of a great circle, and describe a circle. Within this circle will be found all the stars which were *invisible* on the horizon of Palestine (or generally, of places under the parallel 32° north latitude) in that same year 750 B.C. If again, outside this circle, with

[1] Opinions vary from the time of Moses (1300 B.C.?) to that of the successors of Alexander (300 B.C., or even later). The interval is of a thousand years and more.

the same pole, another circle be described 20° distant from the first, we shall then have marked on the globe between the two circles a spherical zone of 20° breadth; within this zone will be included all the stars which in 750 B.C. culminated in Palestine at a height less than 20° above the southern horizon. This is sufficient, since it is among these that we must look for the constellation called *ḥadrē theman* or *chambers of the south*.

49. Now, if we examine this zone, we shall find that for three quarters of its extent it is rather poor in conspicuous stars and contains no really important constellation. But the remaining quarter, which begins with *α Argus* (Canopus) and ends with *α Centauri*, is for the number and brilliancy of its large stars the brightest part of the sky; it is to this that Alexander von Humboldt applies the expression 'the splendour (*Pracht*) of the southern heaven[1].' In a space embracing less than one-thirtieth of the whole sky we see here five stars of the first magnitude (including Canopus, the most luminous of all stars next to Sirius), whereas there are only about twenty such stars in the whole stellar sphere. Further there are five stars also of the second magnitude, while the whole heaven only contains about sixty of them. Nor is there any lack of smaller stars in abundance, down to the furthest limit of those visible to the naked eye[2]. All these stars form a splendid garland, having for its background the densest and most brilliant portion of the Milky Way. No other part of the sky contains in an equal space such a mass of light; it actually produces in the atmosphere a faint twilight illumination like that which the moon gives in the

[1] A. Humboldt, *Cosmos* (Eng. tr. by Sabine, iii. 127).

[2] The relative abundance of this region in stars of all orders visible to the naked eye, from the first to the sixth degree of magnitude, can be verified from the charts appended to the author's article, *On the apparent distribution of stars visible to the naked eye*, in the Publications of the Brera Observatory in Milan, No. xxxiv.

first days after new moon[1]. In 750 B.C. all this region passed to its meridian on the extreme southern horizon of Palestine, the brilliant stars to which we have referred above culminating at a height lying between 5° and 16°[2]. These stars form an imposing constellation, more brilliant than any other, not excepting Orion: on the charts of to-day it is distributed between Argo, the Southern Cross, and the Centaur. This is the constellation which we can with great probability identify with the *chambers of the south*; not only because it satisfies, but because it alone satisfies, all the conditions of the case. In the times to which we are now alluding, the shepherds and peasants of Palestine could have seen it (as they can no longer see) on the extreme southern horizon under an aspect of intense light as though of an *aurora australis* sprinkled with brilliant stars, and have admired a spectacle which can in our time be seen only by those who go towards the equator as far as the twentieth degree of north latitude.

50. An examination of the map of the southern sky will show that the constellation which we have mentioned is connected, from the side of Canopus, with Sirius by means of some beautiful stars of Canis Major and of Argo. In

[1] 'Such is the general blaze of star-light near the Cross, from that part of the sky, that a person is immediately made aware of its having arisen above the horizon, though he should not be at the time looking at the heavens, by the increase of general illumination of the atmosphere, resembling the effect of young Moon.' (Jacob, astronomer at Madras, as cited by Humboldt, *Cosmos*, Eng. tr. by Sabine, iii. note 254 to p. 127.)

[2] Names of these stars, their magnitude, and their height of culmination, under the parallel 32° north in 750 B.C.:—

Canopus	1st magnitude	5°	*γ Crucis*	2nd magnitude	16°
γ Argus	2nd ,,	16°	*α Crucis*	1st ,,	10°
ε Argus	2nd ,,	6°	*β Crucis*	1st ,,	13½°
η Argus	(variable)	11°	*β Centauri*	1st ,,	12½°
ι Argus	2nd magnitude	8½°	*α Centauri*	1st ,,	10½°

The variable star *η Argus* sometimes sinks to the third or fourth magnitude; at other times it rises to the first magnitude and approximates to the brightness of Canopus.

so far it might be permissible to extend this constellation as far as Sirius and to suppose that in *ḥadrē theman* there was also included this last-named star, the most striking and the most luminous in the whole sky. In that case we should have here an allusion in the Old Testament to Sirius as well, whereas otherwise there is absolute silence about it. Yet it must be noted that in 750 B.C., under the thirty-second parallel of north latitude, Sirius culminated at a height of 41°: on this account perhaps it was already too far from the horizon to be included in the *chambers of the south.*

The *chambers of the south* are also alluded to in another passage of Job (xxxvii. 9), where it is said: 'out of the *ḥeder* cometh the tempest.' These chambers, whence issues the tempest, are to be understood as placed in the direction of the south wind; in fact, among the Jews the south wind meant the sirocco, bringing storms and heat, as is clear from some passages quoted in the note below [1]. It seems, therefore, plausible and natural to suppose that the *ḥeder* named here represents the same thing as that which in Job ix. 9 is more clearly indicated by *ḥadrē theman.* The LXX and the Vulgate have used the same words, ταμεῖα and *interiora*, in both passages[2].

51. V. *Mezarim.* The same verse of Job (xxxvii. 9) contains in addition the name of another constellation. Transcribing the verse as a whole, it runs thus: 'Out of the *ḥeder* cometh the tempest, and cold out of the *mezarim.* I cannot agree with the interpreters on the meaning of the word *mezarim.* Some derive it from *zarah* = *disperdo*, from which it is said to be a simple participle = *disperdentes.* So

[1] Job xxxvii. 17: 'Thou whose garments are hot, when the earth is still by reason of the south wind.' Isa. xxi. 1: 'As whirlwinds come from the south.' Zech. ix. 14: 'He will go with the storms of the south.'

[2] A fuller discussion of the meaning of the words *ḥadrē theman* is to be found in an article by the author: 'Astronomical interpretations of two passages in the Book of Job,' published in the Pavia Review of Physics, Mathematics, and Natural Science, 4th year, No. 37, 1903.

they would understand it of the winds as the *scatterers* of the clouds. But why wind and why clouds?

Others have noticed that there is a kind of symmetrical opposition between the members of the verse quoted above: in the first part, the subject is the south and its hot wind; the second refers to the cold, which can only come from the north. This opposition had already been observed by Luther, who translates *Vom Mittag her kommt das Wetter, und von Mitternacht Kälte* ('from the south comes storm, and from the north cold'). So too Diodati: *La tempesta viene dall' Austro e il freddo dal Settentrione* ('the tempest comes from the south, and cold from the north'). Taking account of this fact, it seems natural to think that, if the *ḥeder* of the first half of the verse represents a constellation in the south, the *mezarim*, 'which bring cold,' can be nothing else than a constellation in the north: and what other than the Bear or the two Bears?

52. The LXX translate the second half ἀπὸ Ἀρκτούρου ψῦχος[1], and the Vulgate renders identically: *ab Arcturo frigus*. Only that it is evident in both cases (as has already been observed by Grotius) that instead of Arcturus (the bright star of Bootes) we must understand *Arctos* or the Bear. This confusion is often found in writers who are not specially versed in describing the stars[2]; and in the case in question there can be no doubt of it. As a matter of fact, for the Jews, as for us, cold came from the north, as is clearly stated in Ecclesiasticus[3]; and Arcturus could not be

[1] As a matter of fact, the common text has ἀπὸ ἀκρωτηρίων ψῦχος. But several scholars, with whom Gesenius (*Thes.* p. 430) agrees, have already remarked that ἀκρωτηρίων can only be a copyist's error for Ἀρκτούρου.

[2] A recent example of the confusion between Arcturus and Arctos is given by Stoppani in his work (otherwise most admirable) *Sulla Cosmogonia Mosaica*, p. 310; where Arcturus is said to be a star in the Bear.

[3] Ecclus. xliii. 22: 'Frigidus ventus Aquilo flavit, et gelavit crystallus ab aqua.'

described as a northern star, since its distance from the celestial equator was about thirty-two degrees at the time of the LXX, and about twenty-eight degrees at the time of the Vulgate. Considering all these facts, I think it probable that *mezarim* simply means the constellations nearest to the arctic pole, probably Ursa Major or both the Bears: to which then corresponded, even better than now, the direction of the cold north winds[1]. It is, therefore, fitting that the author of the Book of Job should make the stormy and hot south wind come from the quarter where the *ḥadrē theman*, that is to say, the large southern constellations, appeared; and should make the cold north wind come from the quarter where the most northerly stars, the *mezarim* or the arctic constellations, could every night be seen.

53. We are now in a position to propound a plausible conjecture as to the true reading and the origin of the name which in the pointed Massoretic text is now read *mezarim*. We may first observe that the five Hebrew letters with which this name was written in the original unpointed text could equally well be read, with a somewhat different pointing, as *mizrim*, or also as *mizrayim*, of which the one is the plural, the other the dual, of *mizreh*. Now *mizreh* means a winnowing-fan, the instrument with which grain is scattered in the air to sift it[2]; and it has its root, like *mezarim*, in the word *zarah*, to which we have already referred above, and which, besides the sense *dispersit*, bears also the sense *expandit, ventilavit*.

Now it is easy to see, if the arrangement of the seven stars

[1] About the year 750 B.C. the pole was not far distant from β, ϵ, γ of the Little Bear: so that it could be said to be as near to the pole as it now is. But the Great Bear was then much nearer to the pole than now. Of its seven stars the furthest from the pole was η, the last in the tail, and the polar distance of this one did not amount to twenty-six degrees.

[2] This sense is assured by the use made of it in Isa. xxx. 24 and Jer. xv. 7.

of the Great Bear is considered, that their shape can be compared to a winnowing-fan quite as well as (or perhaps even better than) to a bear or a waggon. In fact, the hollow part of the winnowing-fan, in which the grain is put, may very fairly be said to be represented by the four stars α, β, γ, δ of the quadrilateral; while the stars ϵ, ζ, η may quite well form the handle. The ancient Chinese, following out a similar idea, have recognized in the seven stars the form of a ladle (an instrument which scarcely differs in shape from a winnowing-fan), and, in this conception also, they

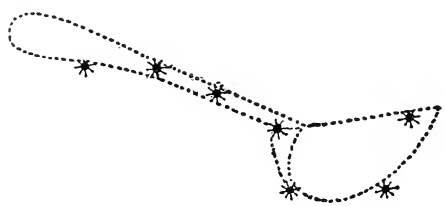


FIG. 3. Constellation of the Winnowing-fan, as conceived by the Jews.

treat α, β, γ, δ as the cavity, and ϵ, ζ, η as the handle[1]. The hypothesis, accordingly, that the Jews, being an agricultural people, might have likened the arrangement of the seven stars to a winnowing-fan, is not devoid of some foundation[2].

To conclude: if *mizreh* may be read in the text of Job xxxvii. 9, we should undoubtedly have to recognize

[1] In the *Shih-king*, or collection of the most ancient Chinese poetry, there is an ode in which the poet, after describing the position of various constellations in relation to his horizon, concludes thus: 'On the side of the north is the Ladle, which lengthens its handle towards the west.' This happens when the Bear is below the pole. See Legge, *The Sacred Books of China*, p. 364 (vol. iii in the collection of the *Sacred Books of the East*, edited by Max Müller).

[2] The figures here given (Figs. 3 and 4) serve to show how the stars of the Great Bear can be represented as a winnowing-fan (according to the conception of the Jews), or as a ladle (according to the conception of the Chinese).

in it the large winnowing-fan represented by the stars of the Great Bear. But as we are obliged in any case to read *mizrim* in the plural or *mizrayim* in the dual, we shall at once perceive that it is not a question here of one winnowing-fan only; and as the Bears in our nomenclature are also two, both readings fit the case perfectly. So we come to learn that the ancient Jews, besides the Great Bear, knew the Lesser Bear also, representing that too to themselves under the shape of a winnowing-fan. Nor can this cause any surprise. It is historically certain that the Phœnicians (which is equivalent to saying the Canaanites) used the Lesser

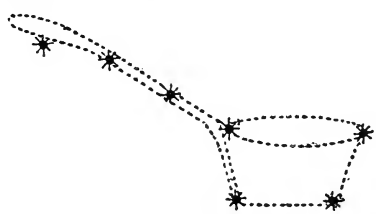


FIG. 4. Constellation of the Ladle, as conceived by the Chinese.

Bear to find the direction of the north when at sea, and for this reason the Greeks, who learnt its use from them, gave it the name Φοινίκη. Consequently, even if the Jews had not noted this constellation on their own account (and the Arabs did learn to note it on their own account), they would always have been able to acquire a knowledge of it from the Canaanites, with whom they lived intermingled in Palestine for several centuries, till they ended by entirely absorbing or assimilating them. The five letters in the text here discussed, which have hitherto been read *mezarim*, ought instead to be pointed so as to read *mizrim* or *mizrayim*, and mean *the winnowing-fans* or *the two winnowing-fans*, corresponding to what we call the two Bears. The result is to confirm, at any rate in substance, the

traditional interpretation preserved by the LXX and the Vulgate [1].

54. Besides the constellations already mentioned, some interpreters think that another is to be recognized in the *naḥash bariaḥ* of Job xxvi. 13, which means *fugitive serpent* (LXX δράκοντα ἀποστάτην: Symmachus τὸν ὄφιν τὸν συγκλείοντα: Vulgate *coluber tortuosus*). There can be no question here of the Dragon of the sky, which winds between the two Bears. The Dragon is in fact one of the artificial constellations, invented by the ancients when they felt the necessity of occupying the whole heaven with groups of figures so as to be able to use a simple method of naming the stars; a constellation whose shape does not carry conviction, just as, for that matter, the two other serpents of the sky, the serpent of Ophiuchus and the Hydra, have no obvious shape, and are mere expedients for filling up. However, if any one is at the pains of comparing the words cited from Job xxvi. 13 with the rest of the speech preceding and following them, he will not think it likely that there is any allusion here to a constellation or even to any kind of astronomical myth.

55. In two other places in Job (ix. 13 and xxvi. 12) we find the name *rahab*, which is differently understood by various writers. The word has in general the sense of ferocity, insolence, pride, and is sometimes employed symbolically to represent Egypt [2]. The LXX in the first of the two passages have κήτη τὰ ὑπ' οὐρανόν; in the second, τὸ κῆτος. Hence Reuss has thought that the allusion is to an astronomical myth: Renan definitely names the constellation

[1] Some further treatment of the question affecting *mezarim* may be found in the author's article on 'Astronomical interpretations of two passages in the Book of Job' (see p. 67).

[2] Ps. lxxxvii. 4, lxxxix. 10; Isa. xxx 7. See Gesenius, *Thes.* p. 1267.

of the Whale, but, to all seeming, with little ground[1]. Further, it may here too be objected that the Whale is not a natural grouping of stars which attracts attention at the first glance: like the Dragon, it is an artificial constellation made to unite together under one figure many stars of no special distinction, which are spread irregularly over a large tract of sky. Hence *Rahab* might be a fabulous monster, like *Leviathan* or *Behemoth*; but it does not seem easy to find for it any connexion with the stars of the sky. In the note are indicated the very divergent interpretations given by various authors for the phrase *'ozĕrē rahab* in Job ix. 13[2]: a comparison of these will enable the reader to see in what grave uncertainty the matter is involved.

56. Strictly speaking, therefore, we find certain designations in the Old Testament for only six constellations, which would come to be identified, more or less plausibly, with the following: Ursa Major, Ursa Minor, the Hyades with Aldebaran, Orion, the Pleiades, and the so-called *chambers of the south*. Ursa Major, the Hyades, Orion, and the Pleiades, are also found in Homer, and, more generally, in almost all primitive descriptions of the universe. To the *chambers of the south*, however, Homer does not allude, as he lived in a more northerly latitude (about 38°), at which some of those stars could not be seen (for instance Canopus), others appeared too low down and immersed in the vapours of the horizon.

[1] Gesenius (*Thes.* p. 1268) makes the just observation that *τὰ ὑπ' οὐρανόν*, 'the things that are *under the heaven*,' are terrestrial things, just as things 'under the sun' or 'sublunary things' are terrestrial.

[2] LXX, *κήτη τὰ ὑπ' οὐρανόν*: Symmachus, *οἱ ἐπερειδόμενοι ἀλαζονείᾳ*: Vulgate, *qui portant orbem*: Luther, *die stolzen Herren* (the proud rulers): Diodati, *i bravi campioni* (the brave champions): Philippson, *des Widerstandes Stützen* (pillars of resistance): Reuss, *des Drachen Bundesgenossen* (the allies of the dragon): Renan, *la milice du Dragon* (*Baleine*?): Delitzsch, *die Helfer des Rahab* (the helpers of Rahab: so R.V.). See Gesenius, *Thes.* pp. 1267–8.

CHAPTER V

MAZZAROTH

Mazzaroth or *Mazzaloth*. — Various interpretations of this name. — It cannot be the Great Bear. — It probably represents the two phases of Venus. — Comparison of a Biblical expression with some Babylonian monuments. — The *host of heaven* reconsidered.

57. The two words *mazzaroth* and *mazzaloth* seem to refer, under a slightly different pronunciation, to the same celestial object or to the same system of celestial objects[1]. In Job (xxxviii. 31–2) the name *mazzaroth* is found in company with various constellations, the whole context standing as follows: 'Hast thou bound the chains of the Pleiades or unloosed the bonds of Orion? Dost thou make *mazzaroth* come forth in his season, and dost thou guide the *'ayish* with her children?' In the second Book of Kings (xxiii. 5) we read of king Josiah that he exterminated those who worshipped and burnt incense to Baal, 'the sun, the moon, *mazzaloth*, and all the host of heaven.'

The ancient versions here give us little aid in regard to these words: we cannot be wrong in saying that the LXX were already ignorant of their meaning, since in both places they do not translate, but simply transcribe them as μαζουρώθ. We have reason to believe that Aquila also did the same. The Vulgate has *Luciferum* in the former of the two passages, *duodecim signa* in the second. Symmachus

[1] The authority of the LXX and of Aquila, whose transcription is μαζουρώθ, seems to support by preference the former mode of pronunciation.

translated by σκορπισθέντα[1]. St. Chrysostom (with whom many others agree) interprets as ζώδια, but remarks that other interpreters identify μαζουρώθ with the heavenly dog, meaning Sirius.

58. It is not even quite certain whether the allusion is to one thing or several. The termination *oth* would certainly seem to indicate a plural, and the majority of interpreters have taken this view. Yet it is worth notice that in Job xxxviii. 32 the Massoretic text reads: *hăthotsi mazzaroth bĕ'ittō*. And the Septuagint is in exact agreement: ἢ διανοίξεις μαζουρὼθ ἐν καιρῷ αὐτοῦ; This can only be translated in English by: 'Dost thou make *mazzaroth* come forth in *his* season?' Clearly then, *mazzaroth* is here considered as a singular. However, the word might be considered to be a plural in grammatical form but not in meaning, as happens fairly often in the Hebrew language[2]. Taking this point of view, it would no longer appear absurd to suppose that *mazzaroth* might stand for a single star. Now, when we read the series in 2 Kings: 'The sun, the moon, *mazzaloth*, and all the host of heaven,' the idea naturally suggests itself that *mazzaloth* is the most luminous star after the sun and moon, worthy as such of being distinguished from all the host of heaven: or in other words, the planet Venus, as the author of the Vulgate supposes[3], and as Theodoret also thought. Consideration will show that there is some reason also, though not equal justification, for the opinion of St. Chrysostom which identified *mazzaloth* with Sirius. Sirius is in fact the most luminous of all stars properly so called.

[1] This is certainly from σκορπίζω = *spargo, disperdo*; so that *mazzaroth* would mean the stars or constellations that are scattered. It is clear that Symmachus derived *mazzaroth* from the root *zarah*, signifying *sparsit, dispersit, dissipavit*.

[2] To take the best known instances: *Elohim* (God), *shāmayim* (heaven), *mayim* (water), all have a plural termination.

[3] Job xxxviii. 32.

59. An examination of the relation that may exist between *mazzaroth* and the constellations *mezarim* leads to a very different result. We have examined *mezarim* above (§§ 51–3), and saw that for reasons of considerable plausibility they could be identified with the two Bears. The relation between *mazzaroth* and *mezarim* was considered as one of complete identity as long ago as the time of the celebrated Aquila, who translated the Old Testament into Greek in the second century after Christ. In the surviving fragments of this version he renders *mezarim* by μαζούρ, which only differs from the μαζουρώθ of the LXX as a singular from a plural. The identity of the two also seemed probable to the great commentator Abraham Aben Ezra; and Diodati's translation of *mazzaroth* by 'segni settentrionali' (northern signs) appears also to rest upon this foundation. It is undoubtedly true that arguments of no slight force can be adduced in favour of this identity, drawn from the analysis of the two words as they stand in the unpointed text. None the less it is certain that, if our conclusions be admitted, according to which *mezarim* (or rather *mizrayim*) represents the two Bears, the identity in question must be entirely set on one side. Whatever may be the star or collection of stars which the Bible indicates by the name of *mazzaroth*, one thing is certain: it cannot be a circumpolar star or a group of circumpolar stars. As a matter of fact, the Hebrew says: 'Dost thou make *mazzaroth* come forth in his season?' Clearly then, *mazzaroth* was a star or a constellation or a collection of stars, subject to periodic appearances and not always visible, that 'came forth' (i.e. rose above the horizon) 'at a determined season.' Now this cannot be said of the *mezarim* or *mizrayim*, supposing that they are the Bears; for the Bears were both absolutely circumpolar for the latitude of Palestine at the time when the Book of Job was written. Hence they could not 'come forth' at any season: as they were con-

tinually visible from evening to morning on any clear night, it could not be said of them that they repeated their appearances at fixed times.

60. The etymology for the word *mazzaroth* given by Symmachus[1] and others, who derive it from the verb *zarah* (*dispersit, dissipavit, ventilavit*), does not seem to lead to any probable conclusion as to its meaning. But another can be drawn from the verb *azar*, which has the meaning *cinxit*: whence *azor* (girdle) and *mazzaroth* (formed in a girdle). *Mazzaroth* would then be stars or constellations arranged in such a way as to form a girdle or a wreath. And so some ancient Jewish interpreters have explained the word by *rota siderum* or *zona siderum*: more recent ones have had recourse to the Corona Borealis, others again to the girdle of Orion. But the former of these two does not seem to be a constellation of sufficient importance or prominence to enter into discussion here; while as for the girdle of Orion, that is undoubtedly excluded by the fact that Orion is found named as a whole, immediately before the *mazzaroth*, in the passage from Job (xxxviii. 31, 32) cited a short way back.—Again, there is in the sky another girdle or wreath of much greater importance, namely, that formed by the constellations which mark in the heaven the course of the sun and of the moon. This is the belt of the signs of the zodiac, which played such a prominent part in ancient astronomy, and still more in astrology. Hence, perhaps, arises the opinion which finds expression in the Vulgate[2] and in St. Chrysostom that the *mazzaroth* are simply the twelve signs of the zodiac: an opinion which has come to be widely spread since and has ended in being received by the majority of interpreters.

61. Gesenius (*Thes.* pp. 869, 870) admits the explanation of *mazzaroth* as the signs of the zodiac, principally on the authority of later Jewish and Chaldaean tradition. He rejects

[1] See above, p. 75.

[2] 2 Kings xxiii. 5.

the explanation 'girdle' or 'wreath' given above, and asserts that the only possible meaning *ex certo linguae Hebraicae et Arabicae usu* is that of 'premonition,' and, in a concrete sense, of 'premonitory stars.' This sense he deduces from the root *nazar*, which among its meanings has, especially in Arabic, that of advising a man not to do something. The interpretation seems very far-fetched; I may also be allowed to remark that the 'premonitory stars' *par excellence* would in that case be, not the twelve signs, but the seven planets, which form the principal basis of all astrology. But the hypothesis of the planets is expressly rejected by Gesenius.

62. It must further be noticed that all is still doubt and mystery as regards the date when, and the nation in which, the zodiac was invented[1]. In the present state of our knowledge, no one is in a position to prove that the zodiac and its twelve signs were already known at the time when Josiah exterminated the worship of the *mazzaloth* at Jerusalem (621 B.C.). Again, if the word bore the meaning of a 'girdle' or 'belt' of constellations encircling the whole sky, that would not be because it stood for the twelve signs, but rather because it represented the twenty-eight stations of the moon, the observation of which is undoubtedly easier and is in a certain way suggested by nature, while the division of the twelve signs is entirely conventional. Hence it comes that

[1] Scholars have in recent years believed that they have found the zodiac on Assyrio-Babylonian monuments, which are much older than anything Greece could have produced on this subject. What they have really succeeded in proving is that three or four out of the numerous figures which are supposed to represent constellations of the Babylonian heavens, belong to the Greek zodiac. A true Babylonian zodiac earlier than the Greek (that is to say, a series of twelve constellations arranged along the annual course of the sun) has not, so far as I am aware, been yet published. The question of the origin of the zodiac is just now being valiantly debated by many learned men, and it would be presumptuous to express an opinion at this moment which did not rest on an accurate study of the documents.

the lunar stations are found in the primitive astronomy of Asia, not only among the Semites of Arabia (and perhaps of Babylon), but actually also among the Indians of Vedic times and among the Chinese of the first dynasty. The Jews, who at all periods of their existence as a nation are found in frequent contact with the Semites as well of Mesopotamia as of Arabia, might easily receive from them the notion of the lunar stations.

63. This hypothesis might find support from the actual meaning of the word, if it be assumed that *mazzaloth* is its right pronunciation. This can, in fact, be derived from the root *nazal*, which is found, not in the Old Testament, but in Arabic writers, with the meaning *descendit, devertit*: *mazzaloth* would then have the sense of 'stations on a journey,' and be perfectly fitted to denote a series of constellations, each of which serves to mark from day to day the tracts of the sky traversed by the moon in twenty-four hours along her apparent orbit. This title, 'stations on a journey,' would correspond very imperfectly with the signs of the zodiac, which constitute an arbitrary and conventional division, not determined by the necessity of the daily rest which forms the fundamental idea of the lunar stations. This interpretation of *mazzaloth* might also be further authenticated by the habit of the Arabs, who have from time immemorial given to their lunar stations[1] the name *menāzil el-kamar*, or 'stations of the moon.' Now, *menāzil* is the plural of *menzil* (station or lodging), a word derived from the Arabic root *nazal*, which we have cited above as having the meaning *descendit, deversatus est.* These considerations would leave no doubt as to the identity of the Hebrew *mazzaloth* with the Arabic *menāzil*, if it were quite certain that the ancient Hebrew would use the root

[1] A full account of the lunar stations of the Arabs may be found in Ideler, *Sternnamen*, pp. 120 and 287.

nazal in the same sense as that in which it is found used in Arabic[1].

64. There is, however, a decisive consideration to which no one appears to have paid attention. According to the narrative in 2 Kings (xxiii. 5), divine honours were offered in Jerusalem to *mazzaloth*, as to the sun and to the moon. The origin of this worship can be sought nowhere else than in Babylonia. Now, in all that is known of the star-worship of the Babylonians, not the least trace can be found of an adoration of the signs of the zodiac or of the lunar stations. This is enough to eliminate all possibility of recognizing in *mazzaroth* either these signs or the lunar stations.

65. Much preferable in this respect would be the hypothesis which supposes that *mazzaroth* stands for the five larger planets. On the adoration of which they were the object in Palestine, we have the positive testimony of Amos[2]: at Babylon and Nineveh they were placed among the greater divinities. Further, the place assigned to *mazzaloth* in 2 Kings, immediately after the sun and the moon, corresponds well to the great brightness of the planets, and particularly of Venus, Jupiter, and Mars. To the planets may be applied in an astrological sense the title 'premonitory stars,' which Gesenius supports. Hence it was just to the planets that the name *mazzaloth* was employed in Rabbinic literature, to indicate the determiners of fate[3]. Lastly, it may be observed that the regular and periodic appearances, which seem to be implied in Job xxxviii. 32, fit in well with the planets.

[1] Gesenius in his *Thesaurus* admits this root *nazal* only in the sense of *fluxit, manavit*. But Leopold in his manual lexicon allows in addition the different sense of *descendit, deversatus est*: probably with a view to *mazzaloth*, which he explains as *deversoria Solis, id est duodecim zodiaci signa*. [The root has this latter sense in Arabic: see Freytag's *Lexicon Arabicum*.]

[2] Amos v. 26.

[3] Riehm, *Handwörterbuch des biblischen Alterthums*, p. 1551.

66. Fox Talbot, one of the creators of the photographic art, and at the same time one of the founders of Assyriology, turned his acute intellect to this question also[1]. He compares *mazzaroth* with the Assyrian word *matsartu*, meaning 'watch.' According to him, therefore, *mazzaroth* would be the constellations which, by their successive rising above the horizon, or rather, by their successive culmination in the meridian, indicated the hours of the night at which the sentinels had to be changed. This idea seems to be worthy of careful consideration. As a matter of fact, in Assyrian, *matsartu* is derived from the word *natsaru*, meaning to 'watch,' *custodire*. Now the same verb, in the same form *natsar* and with the same meaning, exists in Hebrew also, as can be seen from the lexica. So, then, it ought to be possible to derive *matsaroth* in Hebrew from *natsar* in the sense of 'watch,' as in Assyrian *matsartu* is derived from *natsaru* in the same sense. And it can be seen further that the pure and simple meaning 'watch' or 'guard,' corresponds, better than that proposed by Talbot of 'stars determining the changes of sentinels,' to the nature of analogous derivations used in the Hebrew language.

67. We may also observe that the problem of determining at every instant the hour of the night by the appearance of the constellations alone, is not so simple as some might think, and requires a continued study of the sky and its aspects at the various stages of the year. And it is much to be doubted whether in the Assyrian armies (and generally in any army, ancient or modern) astronomical knowledge had reached the point necessary to render this method of changing the watch possible. Probably some means were employed for this object which were also applicable when the sky was clouded over; and perhaps long experience of estimating duration was sufficient for the purpose without any external aid.

[1] *Trans. Soc. Bibl. Archaeol.* i. 339–42.

68. Yet in spite of this, the fact remains that if, with Talbot, the form *matsaroth* is assumed and is considered to be derived from the Hebrew verb *natsar*, the meaning of 'watch' or 'sentinel' deduced from it may lead us to a plausible interpretation, provided that any one of the stars can be found which answers well to this meaning. The two Bears, for instance, would correspond well to this condition, since it can be said of them that they keep watch continuously in the sky and might even be thought of as two sentinels placed to guard the arctic pole of the heavens. But it has already been shown above that there cannot here be any question of circumpolar stars, as *mazzaroth* have to come forth at fixed seasons (§ 59). All the conditions, on the other hand, are satisfied by two stars of exceptional brightness, which keep guard in turn over the sun, the one preceding him in the morning at his rising, the other following him in the evening at his setting: Lucifer and Hesperus, the star of morning and the star of evening. In this way we are led back to the interpretation given by the Vulgate in Job xxxviii. 32 and also adopted by Theodoret.

69. In spite of the small account which the most authoritative expositors seem to have made of it, various other reasons speak in its favour, and render it, perhaps, more probable than any other.

I. This hypothesis is the only one according to which the plural form of the name can be reconciled with the use made of it as one thing in the singular number, in Job xxxviii. 32. In fact the planet Venus, apparently uniting two different manifestations as Hesperus and Lucifer, may have received a plural name from the first, i. e. the name *mazzaroth*[1]. When

[1] Strictly speaking, a dual might be expected, but this is not a necessary condition. For instance, the two tables of the law of Moses are always in the Old Testament named in the plural (*luḥoth*) and never in the dual (*luḥothayim*). That the two aspects of Venus

the identity of its two appearances at morning and evening was discovered, it naturally came to be thought of as one star, and hence the author of the Book of Job used it as a singular in a plural garb.

II. In Job xxxviii. 32 we read: 'Dost thou bring forth *mazzaroth* in his season?' The phrase clearly indicates a law of periodical appearance. Now it is perfectly true that not only the zodiacal stars, but all non-circumpolar stars generally, appear periodically during the year when effecting their heliacal rising; but the special stress here laid on a period seems to indicate something different from what happens with the generality of stars. Again, as in the discourse in chapter xxxviii God propounds to Job a series of things which are impossible to man, and the secret of which is reserved to the Divine mind, one might also suppose that to make a star issue *at the appointed time* constitutes a part of the hidden knowledge to which man is not wise enough to attain.

III. In 2 Kings xxiii. 5 mention is made of those who burned incense 'to the sun, to the moon, to *mazzaloth*, and to all the host of heaven.' Here *mazzaloth* is placed after the sun and the moon, but, along with them, is distinguished from 'all the host of heaven.' The most natural and most probable supposition is that *mazzaloth* is the most brilliant star in the sky after the sun and moon, and that like them it was separated by a long interval from the other stars. Thus we are inevitably led to Venus, which is the only star, after the sun and moon, capable of producing shade.

70. To all this must be added that the mention of the

were at first considered in Babylonia to be two different stars can be proved from a considerable number of monuments. The same can also be shown of the most ancient Egyptians; and with regard to the Greeks, the tradition exists that Pythagoras was the first to recognize that Lucifer and Hesperus were one and the same star.

three stars (the sun, the moon, and *mazzaroth*), considered separately as the three principal stars of heaven, has its special significance in a form of worship that came to the Jews from beyond the Euphrates and was probably introduced along with the Assyrian invasion. As a matter of fact, the sun, the moon, and Venus, occupied a pre-eminent position in the Pantheon of the nations of Mesopotamia. In many and many a sculpture exhumed from the excavations made in Assyria and in Babylonia, and especially where any idea connected with religion appears, a triad of stars is found designed (symbolizing, no doubt, the corresponding deities), each of which has its own peculiar shape, identically repeated everywhere with the same type. These stars are the sun, the moon, and Venus, and their shapes are as they are given here.

FIG. 5. Sin (Moon). Šamas (Sun). Ištar (Venus).

These three shapes occur frequently beside the portraits which we possess of the Assyrian kings, sculptured in bas-relief[1]; and they stand before them in the host of symbols of their protecting deities. The same shapes are also found on the figured reliefs which we possess of the Babylonian

[1] See the portraits in bas-relief of Asshurnazirpal (884–860 B.C.), of his son Shalmanezer II (859–825 B.C.), and of his grandson Samsi-Adad IV (824–811 B.C.), reproduced in the *Transactions of Soc. Bibl. Archaeol.* vol. v. pp. 224, 278, vol. vi. p. 88. See also the bas-relief of Esarhaddon, found in the excavations at Zenjirli in Cilicia and now preserved in the Berlin Museum. On the Assyrian monuments, the figure representing the sun is a little different from that on the Babylonian monuments which is reproduced above.

kings [1]. And they occur finally in another class of monuments which is much more numerous: that is to say, on certain *stelae* or upright stones which were placed in the fields as boundary marks (according to a view held by many), or rather as public titles of property, titles that were inviolable and whose removal was accompanied by the most terrible maledictions, as the inscriptions on the pillars themselves show. These monuments, a great many of which must have existed, as about thirty of them have already been discovered, bear an illustrated scene or representation which displays in the most conspicuous place the three symbols of the sun, the moon, and Venus, as described above, arranged for the most part in the following order,—the first place is given to the moon, the second to the sun, the third to Venus.

71. The supposition would not therefore be far-fetched that in the Temple at Jerusalem, Ahaz or one of his successors might have erected a monument analogous to those described above. Then the 'host of heaven,' to which the Biblical writer alludes in 2 Kings, would not be absent either. In fact, on the boundary pillars or titles of property of which we have spoken above, after the three symbols of the sun, the moon, and Venus (or round about them, when the representation is circular in shape), a whole crowd of strange figures invariably stand designed. Among them can be distinguished a large snake, a scorpion, fantastic and monstrous animals sometimes wearing a terrifying expression, a winged centaur in the act of shooting, a goat with a fish's tail; further, various emblems of a more simple

[1] For instance, on the pillar of Nebuchadnezzar I (about 1130 B.C.), reproduced in Rawlinson, *Cuneif. Inscript. of Western Asia*, V. tab. 57. Also on the stone of Nabupaliddina (about 860 B.C.), found by Rassam in the ruins of Sippara and often published, e.g. by Hommel, *Gesch. Babyl. u. Assyr.* p. 597.

character, such as altars with tiaras or points of lances above them, a lamp, an arrow, a staff, and other objects, which are hard to explain, but are found sculptured in greater or less number on each monument. About forty figures are

FIG. 6. The sun, the moon, Venus, and the Host of Heaven, on a Babylonian monument of the twelfth century B.C.

known up to the present, some of which are repeated with greater frequency, others more rarely.

72. Clear evidence as to the subject of these figures is given in some of the inscriptions which usually accompany them[1]: they are nothing else but emblems or symbols of

[1] On a pillar of this kind belonging to the reign of Mardukbaliddina I (about 1170 B.C.) it is said, if any one remove it from its place, conceal it, or destroy it, 'May the gods Anu, Bel, and Ea, Ninip and Gula, and all the deities *whose emblems are seen on this stone tablet*, violently destroy his name: may a terrible malediction fall upon him,'

divinity or of supernatural beings, to whose protection the permanence and preservation of the monument was commended. Not, however, of divinities of any kind indifferently. If in fact we observe these figures carefully, we see that some of them have a more or less complete resemblance to certain figures representing constellations of the Greek sphere, and a still greater resemblance sometimes with the sphere as conceived by the ancient astrologers, the so-called *barbarian* sphere: thus the identity is occasionally complete, as between the Babylonian scorpion and the scorpion of our zodiac, between the goat with a fish's tail of the Babylonian pillar and our capricorn, between the winged shooting centaur of the Babylonians and the archer of the barbarian sphere and of the Egyptian zodiacal sculptures[1]. Hence some Assyriologists[2] have wished to recognize in these figures a series of zodiacal signs or of other constellations belonging to the Babylonian sphere. That an astronomical character is to be discovered in them seems probable, not only on

&c. (G. Smith, *Assyrian Discoveries*, ed. 2, p. 241). On another, belonging to the reign of Marduknadinachi (about 1115 B.C.) the corresponding curse is expressed as follows: 'May the deities *whose images are on this stone* and whose name is invoked persecute him with irrevocable maledictions' (Oppert, in *Records of the Past*, vol. ix. p. 101).

[1] On this and other resemblances see the recent important work of F. Boll, called *Sphaera*, pp. 181–94: on the Babylonian astronomical works of the class described above, see the same work, pp. 198–208, besides that of Hommel cited in the following line.

[2] So Hommel (*Aufsätze und Abhandlungen*, pp. 236–68), whose conclusions, however, can hardly stand criticism. On the other hand, Morris Jastrow (*Relig. Babyl. u. Assyr.* p. 192) not only rejects them, but falls into the opposite extreme and denies emphatically that the relations between the divinities of the Babylonian Pantheon and their pictured emblems depend on principles or facts of astronomy or astrology. Perhaps the truth lies between them. We can admit some connexion of these emblems with celestial phenomena; only we are not in a position to indicate the nature of this connexion.

account of the coincidences just mentioned, but also because the symbols of the moon, the sun, and Venus, are, as has been said, always present on these monuments. I believe myself that it cannot be wrong to consider them as emblems or material representations of the divinities of heaven, since there were bound to be such divinities; including in this number the divinities of the planets and the good and bad spirits with which Babylonian theology associated the stars and constellations of the firmament. These are the 'angels of the hosts of heaven,' over which Marduk reigned, according to the hymn cited above (§ 33); this is the 'host of heaven' named by Nebuchadnezzar in his large inscription, and the worship of which at Jerusalem caused so much horror to the prophets of Israel.

73. As we have seen, the Biblical expression (2 Kings xxiii. 5) about those who adored 'the sun, the moon, *mazzaroth*, and all the host of heaven,' is found graphically illustrated by the monuments here described, in the most complete and unexpected manner. Sun, moon, and *mazzaroth* are distinguished in this Biblical passage by being named specially and in the first place: on the monuments they are distinguished by their place of precedence when the figures form a line, or by occupying the central position when the figures are distributed over a circular or oval space. As for the remaining multitude, 'the host of heaven,' it would be of profound interest to examine the various classes into which they were probably divided, and their hierarchy. But this is not a subject to be treated briefly, or in this place: its relations are not so much with the astronomy of the Bible as with the mythology and uranography of the Babylonians [1].

[1] Instructive enough drawings of the Babylonian monuments belonging to the class here considered can be found in well-known works. There is one in the second edition of G. Smith's *Assyrian*

Discoveries, showing the *stela* of Mardukbaliddina I (about 1170 B.C.), which was cited on page 86. Another, referring to the reign of Marduknadinachi (about 1115 B.C.) is to be seen represented in lateral perspective in Bezold, *Ninive und Babylon*, p. 52. Reduced to circular projection, it has been published by Lenormant, *Histoire de l'Orient* (ed. 9, continued by Babelon, vol. v. p. 183). Thus reduced, it appears as in our Figure 6 above. Here the three symbols of the moon, the sun, and Venus, occupy the convex top of the monument, which is at the same time the centre of the surface covered by figures. The same is the case with the so-called 'Michaux stone' preserved in the Bibliothèque Nationale at Paris, which has been often reproduced during the last century, and, recently again, in the work by Lenormant to which we have referred, in Hommel's *Gesch. Babyl. u. Assyr.* p. 74 [and in Maspero's *Dawn of Civilisation*, pp. 762–3]. To the same category belongs also the fine relief of Nebuchadnezzar I, the figures of which may be seen excellently reproduced in Bezold, *Ninive und Babylon*, p. 49.

CHAPTER VI

THE DAY AND ITS DIVISION

The evening at a certain point of twilight regarded as the beginning of day. — 'Between the two evenings.' — Divisions of the night and of the natural day. — The so-called sundial of Ahaz. — No mention of hours in the Old Testament. — The Aramaic *sha'ah*.

74. THERE can be no doubt that the Jews placed the beginning of the civil day or *nychthemeron* in the evening, nearly in the manner which was usual among the Italians a hundred years ago, and is still adopted by the whole Mohammedan world. In fact, Genesis, after relating the works completed by God on the first day of creation, concludes thus: 'And the evening and the morning were the first day.' The same is repeated regularly for all the days of creation. The evening was therefore understood to precede the day. A still more convincing piece of evidence is to be drawn from Ps. lv. 17, where the words are: 'At evening and at morning and at midday will I complain and moan,' &c. Here the evening precedes both morning and midday. All festivals of the Jews, which were so arranged as to be obliged to last through one or more entire days, began with evening and ended with evening. So the repose of the sabbath lasted from the evening of one day down to the evening of the following day. The same is to be said of the Day of Atonement [1], which was observed in the seventh month, lasting from the evening of the ninth day to the evening of the tenth; and of the Feast of Unleavened

[1] *Yom hakkippurim*. See Lev. xxiii. 32.

Bread, which began with the fourteenth day of the first month at evening, and ended with the twenty-first day at evening [1]. It may be added that the Jewish community still commence their ritual day in the evening [2].

75. This habit of commencing the civil day or *nychthemeron* with evening was originally practised by those peoples who adopted the rule of taking for the beginning of their month the moment at which the new moon first became visible to them in the evening twilight. As Ideler justly remarks on this subject [3], there is a certain connexion between the two things; it was, in fact, natural to commence to count the first day of the month from the same instant as that at which the month itself was supposed to begin, and it is easy to see what inconveniences the custom would have caused of commencing the month at one moment and the first day of the month at another. Now the Jews, as we shall see, were in the habit at every period of their history of counting the months from the instant when the luminous crescent of the moon began to become visible after its conjunction with the sun; that is to say, from the instant of the visible new moon. The practice of commencing the day with evening was deduced from this as a consequence, by the Jews as well as by other peoples, among whom the Greeks are to be included.

76. The Hebrew word for the evening is *'ereb*, from the root *'arab* meaning *niger fuit* [4]; it alludes, therefore, to the

[1] Exod. xii. 18.

[2] Ideler, *Handbuch der mathematischen und technischen Chronologie*, i. 80.

[3] Ideler, *op. cit.* i. 482.

[4] So Gesenius, *Thes.* 1064. But the verb *'arab* in the sense *niger fuit* is not found in the Old Testament. It seems difficult, however, not to admit a connexion between the Hebrew *'ereb* and the *erēb Samsi* of the Assyrio-Babylonian inscriptions, which means 'setting of the sun' (literally 'entry of the sun' below the horizon—from *erēbu*, to enter).

gradual darkening of the atmosphere after the sun has set. Like the name *sera* (evening) in Italian, it was generally used in a somewhat indeterminate sense, including both the last part of the clear day and the beginning of darkness. What was the moment of evening which constituted the end of one *nychthemeron* and the beginning of the next *nychthemeron*?

There can be no doubt as to the answer. Among those peoples who marked the beginning of the month by the moment when in the dusk at evening there appeared towards the west the faint crescent of the new moon, the beginning of the day could be only that phase of evening twilight when the observation of the crescent became possible. This phase could not be the setting of the sun, because the lunar crescent could not yet be visible in full daylight; and neither was it the end of twilight and the beginning of the complete darkness of night, because the most brilliant stars and the planets are wont to become visible a good while before the sky is completely blackened; how much more the lunar crescent! That crescent is accustomed to appear at an intermediate moment, when the stars are not yet seen, though the light of dusk has already much diminished. Experience shows this moment of first visibility to depend on several circumstances, which vary from one new moon to another[1]; but it can be defined in a general and approximate manner by saying that the crescent is accustomed to appear when the sun has sunk about six degrees below the horizon. In the latitude of Palestine this may be said to happen, taking one time with another, half an hour after sunset, and one complete hour before twilight is ended and the complete darkness

[1] The chief among these are the angular distance of the moon from the sun at the moment of observation, the height of the moon above the horizon, the moon's distance from the earth, the degree of clearness of the atmosphere.

of night begins. Accordingly, on the evenings of a new moon the duration of twilight from the moment of the crescent's appearance is divided into two unequal parts, which the Jews called 'the two evenings,' or in Hebrew *'arbayim*. The first evening formed an interval of about half an hour, during which, as it was still sufficiently light to be considered as a continuation and part of the preceding day, the common occupations of the day could be attended to; that interval, in fact, which we call the 'twilight of the civil day [1].' The second evening lasted nearly an hour; its beginning marked the beginning of the following *nychthemeron*; its end was at the commencement of the complete darkness of night; when it began, the lamps were lighted, an action which ushered in the period of night. In the Pentateuch we find use made several times of the expression *bēn hā'arbayim* ('between the two evenings') [2] to indicate the moment which separated the two periods described above, and marked for the Jews the beginning of the civil and religious day. Of special interest is the passage in Exod. xxx. 8, where Aaron is spoken of as lighting the lamps of the tabernacle 'between the two evenings'; it is decisive on the meaning of the expression *bēn hā'arbayim* (which has been much discussed [3]), and shows clearly that what is indicated by it is the moment of evening twilight when the natural light became insufficient and it was necessary to resort to artificial light [4]. One

[1] The twilight of the civil day is assumed to commence at sunset and to end when the sun attains a depth of 6½° below the horizon. The average duration of this twilight in Palestine is about half an hour.

[2] Exod. xii. 6; xvi. 12; xxix. 39, 41; xxx. 8; Lev. xxiii. 5; Num. ix. 3, 5; xxviii. 4.

[3] Those who wish for information as to this discussion, can gain an idea of it from Ideler, *op. cit.* i. pp. 482–4; and from Gesenius, *Thes.* pp. 1064–5. The question was important for determining the right moment at which the Paschal lamb had to be sacrificed and the week of unleavened bread begun.

[4] This method, therefore, was analogous to the old Italian custom of

certainly cannot suppose that Aaron lighted the lamps with the sun still on the horizon, nor yet that he waited to light them till it was altogether impossible to see any more.

77. The night was called *layil* or *laylah* by the Jews, a word of uncertain derivation. Its duration was divided by the Jews, after the example of the Babylonians[1], into three 'guards' or 'watches,' while the Greeks and Romans divided it into four. The first was called 'the evening watch' or 'the beginning of the watches'; the second, 'the midnight watch'; the third, 'the morning watch[2].' The 'half of the night' (or 'midnight') is also found named in the Old Testament[3].

78. The morning in the broad sense is generally indicated by *boqer*, which is also applied in a more particular sense to the first light. The twilight (*nesheph*) of the morning bears the further title *shaḥar*, equivalent to dawn. The Jews had two dawns, as they had two evenings; the two dawns were separated by an intermediate phase of the morning twilight, *bēn shaḥarayim*[4].

beginning the *nychthemeron* half an hour after sunset, at the moment when the twilight of the civil day was closed. Ideler, *op. cit.* i. 83.

[1] The three watches of the Babylonians were given precisely the same titles as the Jews used: the first watch, the midnight watch, the morning watch. All three are found named together on a small tablet in the British Museum, published in Rawlinson, *Cuneiform Inscriptions of Western Asia*, vol. iii. tab. 52, no. 3; partly translated and explained by Sayce, *Trans. Soc. Bibl. Archeol.* iii. 151–60.

[2] The 'beginning of the watches' is found named in Lam. ii. 19; the midnight watch in Judges vii. 16; the morning watch in Exod. xiv. 24 and 1 Sam. xi. 11.

[3] *Ḥătsi hallaylah*, Exod. xii. 29, Judges xvi. 3.

[4] *Shaḥarayim* is not, however, found used in this sense in the Old Testament, but only as a proper name, 1 Chron. viii. 8. None the less, this dual form suffices to prove that 'two dawns' were distinguished as parts of the morning twilight, even though little practical use may have been made of the distinction.

79. The word *yom*, like its equivalent in Italian *giorno* (day), was used to indicate both the whole *nychthemeron* and also the illuminated part of it only, that is to say, the natural day. The one common division of the natural day is given by midday, *tsohŏrayim*, a word derived from *tsahar*, which probably signified *splenduit*, *luxit* (in Arabic, 'to appear'). It is the dual of *tsohar*, light. So then *tsohŏrayim* would be equivalent to saying 'double light,' and would be a way of expressing the greatest light of the day. Ewald[1] is, however, of opinion that this dual ought to be classed with the two evenings and two dawns of which we have already spoken; *tsohŏrayim* would in that case mean two parts of the day, those which immediately precede and follow the point of midday. The duration of these two parts cannot be assigned, as they are not limited by any special natural phenomenon.

80. But the division of the day into two parts only is insufficient for practical purposes. Consequently, the Jews aided themselves by other designations arrived at indirectly. We find, first, the two moments mentioned, before and after midday, at which the sacrifice called *minḥah*[2] was accustomed to be offered in the Temple. How far they were from midday cannot be determined.—Other indications of the

[1] Ewald, *Antiquities of Israel*, Eng. tr., p. 340. Ewald's opinion seems to be confirmed by the phrase *bethoch tsohŏrayim* ('in the midst of the two lights'), which would allude to two consecutive intervals of greatest light (Isa. xvi. 3).

[2] Diodati translates this *offerta di panatica* (R.V. 'meal-offering'). It consisted of flour, hominy, or meal, seasoned with oil and salt. An allusion is made to the time of morning sacrifice in 2 Kings iii. 20, which shows that it was made very early: to the time of evening sacrifice in 1 Kings xviii. 29 and 36, whence we infer that a considerable period of daylight remained available after it. In the service of the second Temple, according to the directions in Exodus (xxix. 38–41), one of the sacrifices was to be made in the morning, the other 'between the two evenings.'

same kind are: 'in the heat of the day' or 'in the heat of the sun[1]'; 'the declining of the day[2]'; 'the approach of evening[3]'; 'the time of taking food[4].' That this simple way of describing the periods of the day can suffice during a long time for a pastoral and agricultural people is proved by our own experience of every day. Even in a more cultivated society the majority of men live without clocks, and contrive by hook or crook to fix the time for themselves with such precision as is sufficient for their wants. In country districts quite simple persons are to be found who watch the sun and know how to mark the time at every stage by this method, without blundering by more than twenty or thirty minutes.

But the idea of *hours*, that is to say, of a regular division of the day into equal parts, seems to have been unknown to the Jews till some time after the exile; it is certain at any rate that the corresponding word is not found in the Hebrew of the Old Testament, and only begins to appear in the dialects used in Palestine after Hebrew ceased to be the spoken language of ordinary life,—dialects belonging to the Aramaic branch of the Semitic languages. This consideration leads us to consider the question of Ahaz's so-called sundial, which would seem to have been placed in the royal palace at Jerusalem by order of that king about 730 B.C.

81. It is narrated in the Second Book of Kings[5] that, when Hezekiah king of Judah wished for a sign of the speedy recovery promised to him by Isaiah, 'Isaiah said: Let this be to thee a sign from Yahwe that He will do the thing that He hath spoken. Shall the shadow go forward ten *ma'ăloth*, or go back ten *ma'ăloth*? And Hezekiah said:

[1] Gen. xviii. 1; 1 Sam. xi. 9; 2 Sam. iv. 5.
[2] Judges xix. 8.
[3] Deut. xxiii. 11.
[4] Ruth ii. 14.
[5] 2 Kings xx. 9–11.

It is easy for the shadow to go down ten *ma'ălôth* [further], but not that the shadow return back ten *ma'ăloth*. And Isaiah the prophet cried unto Yahwe, and He made the shadow return by as many *ma'ăloth* as it had gone down on the *ma'ăloth* of Ahaz, namely, ten *ma'ăloth* back.' The same incident is related rather more shortly in the historical section of the prophecies of Isaiah[1], where the prophet says to Hezekiah: 'And let this be the sign to thee. . . . Behold, I will make the shadow return by as many *ma'ăloth* as it has gone down on the *ma'ăloth* of Ahaz with the sun, namely, ten *ma'ăloth* back. And the sun returned ten *ma'ăloth* back, as many *ma'ăloth* as it had gone down.' The interpretation of this passage presents a certain amount of obscurity, not only as to the sense to be attributed to the word *ma'ăloth*, but also because the same word is here found used in two somewhat different manners. It appears first as a simple plural expressing a certain number of the units, each one of which is called *ma'ălah*. In the second place it is employed to mean some construction arranged by Ahaz, which contained a number of the units *ma'ălah* exceeding ten; along it a shadow glided while the sun advanced in its daily motion, and the whole is so arranged that Hezekiah could observe the displacement of the shadow while in a lying posture on his bed.

82. The word *ma'ălah* almost always means a step on a staircase[2]: the plural *ma'ăloth* may also be understood of a flight of steps or staircase. We shall have accordingly to picture the matter to ourselves in this way: Ahaz, on the occasion of the new buildings arranged by him in the

[1] Isa. xxxviii. 8.

[2] Gesenius, *Thes.* p. 1031, where the passages of the Old Testament are given which confirm this interpretation. The few cases which seem to require another meaning are also cited in the same place, but it would not be suitable to dwell upon them here.

Temple and the royal palace[1], had caused a flight of steps to be made, which was called in consequence the *ma'ăloth*, or steps, of Ahaz. The shadow of some higher part of the rest of the edifice projected over these steps; this shadow, gliding from step to step, was continuing to descend at the hour of the day when the prodigy occurred. It is not impossible that these steps were used by some as points of reference for guiding themselves as to time; this is a natural proceeding, and analogous practices have been adopted at all times and places. However that may be, the miracle, as understood by the writer, was this: after the shadow had gone down the ten steps, it mounted them all again, at the command of Isaiah. The second of the two narratives which have been quoted would further imply a retrogression of the sun; the first narrative does not clearly imply this prodigy, which would be equal to or even greater than that of which Joshua has the credit.

83. The most ancient interpreters have understood the matter in the way here explained: so the LXX and the Syriac version. But Symmachus, in his Greek version of the second century A.D., and, later on, the Vulgate and the Targum (or interpretation by learned Jews), put another opinion into the field which is now almost universally received. According to this second way of looking at it, the *ma'ăloth* of Ahaz are said to have been lines marking the hours on a solar quadrant, which Ahaz had caused to be placed in the palace at Jerusalem, each line constituting a *ma'ălah* or step of progression of the shade. This sundial claims to have been imported from Babylonia, since the invention of the gnomon and the quadrant for marking hours are certified as existing among the Babylonians by the authority of Herodotus[2]. All this must be admitted to be possible. It is, in fact, probable that the invention of the sundial (as may be

[1] 2 Kings xxiii. 12; xvi. 18.

[2] Herod. ii. 109.

said with certainty of the division of the day into hours) is due to the Babylonians, even though none has as yet been found in the Mesopotamian ruins. And king Ahaz, who seems to have been exceedingly fond of foreign customs, might well have caused a sundial to be placed in his palace by some Babylonian or Syrian or Phoenician astronomer. But it has already been remarked that not the slightest hint is given in the Old Testament of regular divisions of the day, either at the time of Ahaz or later. Again, the distant and imperfect resemblance which lines for marking hours can have with the steps of a staircase does not seem to me sufficient to justify the abandonment of the interpretation given by the LXX, which adapts itself so exactly and so naturally to the actual words of the Hebrew text[1].

84. The regular division of the day into equal portions was practised at Babylon long before the exile of the Jews. The fragments of Babylonian astronomy which have been unearthed at Nineveh prove that the custom there was to divide the *nychthemeron* into twelve *kaspu*, each of which corresponded to two of our equinoctial hours[2]. It would

[1] The steps of Ahaz and his so called sundial have given rise to a whole literature, from which curious and eccentric ideas are not absent. A collection of these may be found in Winer's *Bibl. Realwörterbuch*, i. 498–9. Most remarkable of all appears to me to be a problem of gnomonics, in which it is proposed to determine how and when and in what places on the earth the shadow projected by a gnomon on a plane perpendicular to it, after having revolved for a certain part of the day round about the foot of the gnomon in a given direction, may remain stationary for a moment, and then revolve in the opposite direction, returning upon its course. We leave to the reader the whole pleasure of resolving *proprio Marte* this none too difficult problem, and of seeing how it would be possible to reproduce in a certain sense the reported miracle of the retrogression of the shadow on the supposed quadrant of Ahaz.

[2] 'On the sixth day of the month Nisannu the day and the night balanced each other: six *kaspu* of day and six *kaspu* of night.' This important observation is to be found in Rawlinson's *Cuneiform Inscriptions*

consequently not be unlikely that the Jews, when they came in contact with the Babylonians in the exile, should have learned from them, along with other things, the habit of dividing the time of day with greater precision than had been their previous practice. They could have borrowed it from the Egyptians even long before this: for we know of the Egyptians that, as early as the date of the Pyramids, they were acquainted with the division of the natural day into twelve equal portions and of the night into as many [1]. But it is impossible to find any proof of this in the books of the Old Testament. It is true that in the Book of Daniel there is found repeated several times the word *sha'ah* or *sha'ăthah*, which the LXX translate by ὥρα and the Vulgate by *hora* [2]. We notice, however, that this word occurs only in the Aramaic part of the text of Daniel, the original Hebrew of which is lost; we do not know what word corresponded to it in the Hebrew. Further, the meaning of *sha'ah* or *sha'ăthah* in these passages does not seem to imply hours truly and properly so called, that is to say, measures of time; it ought rather to be taken in the sense of moment or point of time, as is done among ourselves when we use such expressions as *a quest' ora* ('at this hour of the day'), *in mal' ora* ('in an evil hour'), *all' ora* ('the very hour'), and so on. The ὥρα in the LXX and the *hora* of the Vulgate are certainly to be understood thus [3]. At what date the use of

of Western Asia, vol. iii. tab. 51, no. 1; translated by Sayce in *Trans. Soc. Bibl. Archaeol.* iii. 229. Unfortunately the year in which the equinox was observed is not given.

[1] Brugsch, *Die Aegyptologie*, pp. 364–5.

[2] Dan. iii. 6, 15; iv. 33; v. 5.

[3] See Gesenius, *Thes.* pp. 1455–6. In all the passages cited the word stands in the connexion *bah sha'ăthah*, for which we could well say, 'the same moment.' It may be added that the LXX and the Vulgate use ὥρα and *hora* in places in the Old Testament where the Hebrew has *'ēth*, which is, strictly speaking, equivalent to καιρός or *tempus*: e.g. Josh. xi.

hours began to be disseminated among the Jews, it is no longer possible to show. It is certain that in the times of Christ they had adopted for the night the four watches of the Romans[1], and that they divided the interval between the rising and setting of the sun into twelve equal parts, after the example of the Greeks. These were the 'temporary hours,' varying in duration according to the seasons, which were numbered as first, second, third . . . down to the twelfth[2]. Dante in the *Divina Commedia* still counts time according to hours of this kind. At the present time they are reserved for the liturgical purposes of the Church.

6; 1 Sam. ix. 16. There is reason to believe that the word for *hour*, under the form *sheti*, which differs little from *sha'ăthah*, was in use among the northern Syrians as early as the fifteenth century B.C. But there is no proof of this as regards the Jews, who, for that matter, had not yet entered the land of Canaan at that time. See Winckler, *Die Thontafeln von Tell el-Amarna*, Lett. 91, l. 77.

[1] Matt. xiv. 25. [2] Matt. xxvii. 45.

CHAPTER VII

THE JEWISH MONTHS

Lunar months. — Determination of the new moon. — Order of the months, and beginning of the year at different epochs of Jewish history. — Phoenician months. — Numerical names employed from the time of Solomon onwards. — Adoption of the Babylonian months after the exile.

85. The calculation of the months and the calendar of feasts among the Jews has been regulated in every epoch, as it still is regulated at the present time, on the phases of the moon; nor, in spite of what might have been expected, can any traces be discovered amongst them of the old Egyptian calendar[1]. In Psalm civ we read that God 'made the moon for the determination of the seasons[2].' All the Jewish festivals were regulated by the moon. The Hebrew name for a month is *yeraḥ*, from *yarēaḥ* moon; it is also called

[1] Ewald (*Antiquities of Israel*, Eng. tr., p. 343) would recognize the use of the Egyptian calendar among the Jews before Moses, in the fact that, even later, a month in the Bible is generally calculated as thirty round days. But it does not seem to me possible to found much on this circumstance. The habit of attributing approximately thirty days to a month has lasted to the present time on all occasions when absolute accuracy is not considered necessary. And if lunations are used, it is more exact (if whole numbers are to be adopted) to count by thirty days than by twenty-nine. As for the year of 365 days, which Ewald would gladly believe to have been imported from Egypt in very early times, the reader should consult § 98, p. 126.

[2] Ps. civ. 19. The same thing is said more diffusely in Ecclus. xliii. 6–8.

ḥodesh, which properly means renewal of the moon or new moon[1].

86. The beginning of the month (*rosh ḥodesh*) was determined, as has been already said, by the first appearance of the new moon in the west in the evening twilight, and was regulated simply, whenever it was possible, by direct observation of the lunar crescent. When this proved impossible, probably the days were numbered from thirty to thirty. I say *probably*, because there is no indication in the Old Testament of the way of fixing the beginning of the months. We know only that in times subsequent to the Christian era this and other similar expedients were still in use in the schools of Iabne and Tiberias[2]. That the date of the new moon could, at any rate on some occasions, be known in advance, seems to be proved by the conversation between David and Jonathan recorded in the twentieth chapter of the first Book of Samuel. David says to Jonathan: 'Behold, it is new moon to-morrow, and I should not fail to sit at meat with the king[3].' We see in any case that the first day of the month was considered as an exceptional solemnity as early as the times of Saul. Religious rites for this day are not yet prescribed in the First Code of the Mosaic Law[4], but mention is already made of them in the time of Elisha, and in the most ancient prophets, including Hosea and

[1] From the root *ḥadash* = the Latin *novus fuit*.

[2] The principal notices bearing on the practices of later Judaism as regards the determination of the beginning of the month have been collected by Schürer, *Gesch. d. jüd. Volkes im Zeitalter Jesu Christi*, ed. 4, vol. I. pp. 749–51 [cp. Eng. tr. of earlier edition, I. ii. 363].

[3] 1 Sam. xx. 5, 18, 24, 27. One way of escaping the consequence here deduced would be to suppose that this conversation took place late in the evening or at night, after the new moon's crescent had appeared. But not even this supposition avoids all difficulties: for as the first day of the month would then already have commenced, *to-day* should be said instead of *to-morrow*.

[4] On the First Code, see the Introduction, § 10.

Amos[1]. In the second Temple the new moon was celebrated with special sacrifices, as can be seen from the twenty-eighth chapter of Numbers. The problem of determining the new moon continued to assume greater importance as time went on, and it is not impossible that, from after the exile down to the institution of a regular calendar, the doctors and heads of the Synagogue made use in some way of the procedure adopted by the Babylonians and the Syrians.

87. At different epochs of their history the Israelites used different systems of months, one after the other, and sometimes more than one at the same time. It is unknown what names they used for the months, before they conquered the land of Canaan. After the conquest they adopted the Canaanite names, down to the epoch of Solomon and the foundation of the first Temple. But the Canaanite names and the order of the Canaanite months were abolished when, at the building of the Temple, a more regular and more strictly national form was given to the system of worship. Then the months began to be described by numerical names in their order, without any special designations; and for religious purposes this use lasted till the destruction of Jerusalem by Titus. But immediately after the return from the exile under Zerubbabel, we already find the Babylonian names adopted in civil use: after the destruction of the second Temple these latter ended by gaining the upper hand in religious use also, and they continue down to the present day to be exclusively employed in the Synagogue. We may now examine with somewhat greater precision the series of these changes.

In the most ancient documents of the Jewish law which have reached us (that is to say, in the First Code and in

[1] Amos viii. 5; Hos. ii. 11; 2 Kings iv. 22 sqq. For later times see Isa. i. 13, 14; Ezek. xlv. 17; xlvi. 1, 3, 6; Num. x. 10; xxviii. 11–14; &c.

Exodus xxxiv, which is derived from the First Code[1]), the month in which the feast of unleavened bread was celebrated is called by the name *Abīb*; this means month of the ears, and corresponded nearly to the month of April. Other ancient names of months are found in the minute account of the fabric and consecration of Solomon's Temple, which has been preserved in 1 Kings, and is probably taken from a narrative contemporary with the event. This account gives the correspondence of these names with the titles which came later into use. Four of them which are preserved are set out below, with the correspondence referred to:—

Ancient months.	*Ancient order.*	*Later order.*	*Equivalent modern names.*	*Reference in Old Testament.*
Ethanim	First month	Seventh month	October	1 Kings viii. 2
Bul	Second ,,	Eighth ,,	November	1 Kings vi. 38
Abīb	Seventh ,,	First ,,	April	Exod. xxiii. 15
Ziv	Eighth ,,	Second ,,	May	1 Kings vi. 1, 37

Some further light has been recently thrown on the origin of these names. It was already thought by many that they were the regular names for the months among the inhabitants of the land of Canaan, with whom the Israelities had intermingled since the conquest, and from whom they had borrowed this use. This supposition has been brilliantly confirmed by the study of the Phoenician inscriptions, in three of which the month Bul has been recognized, and in two others the month Ethanim[2]. The older Jewish calendar

[1] Exod. xxiii. 15 and xxxiv. 18. From these ancient documents we must suppose the later notices in Deut. xvi. 1 and Exod. xii. 4 to be derived.

[2] See the complete collection of the Phoenician inscriptions quite recently published by Landau (*Beiträge zur Alterthumskunde des Orients*, fasc. ii and iii). The name Bul is found in the long inscription of Eshmunazar, king of Sidon (Land. 5; Cooke, *North Semitic Inscrip-*

was therefore identical with that of the Phoenicians, that is, of the Canaanites, to whom the Phoenicians were nearly related. It was also used in the Phoenician colonies, at Carthage, in Malta, and in Cyprus.

88. As the close affinity between the Phoenician and Hebrew languages is known, it is even possible to speculate with some probability on the etymology of these names. It has already been said that the month Abīb means the month 'of ears'; for the ears were already formed in Palestine in this month, though not entirely ripe [1]. Ziv means 'splendour of flowers,' a name well adapted to the corresponding month, which was nearly the same as our May, the *floréal* of the French Jacobin calendar [2]. The meaning of Ethanim is less clear; Gesenius and Ewald [3] would make it equivalent to 'continual waters'; perhaps because the autumnal rains supervene in October, and the watercourses commence to be refilled after the dryness of summer. Lastly, the abundance of rain in November is well represented by the name Bul, at least if this is rightly interpreted as meaning 'copious rain [4].'

89. These same Phoenician inscriptions, of which I have spoken just above, have already contributed, and will probably contribute still more, to our further knowledge of the Phoenician calendar, which is equivalent to saying the most ancient Jewish calendar. In inscriptions of Cyprus, of Malta, and of Carthage [5], the month Marpeh is found, which may

tions, p. 31), and in two other inscriptions from Cyprus (Land. 15 and 96; Cooke, pp. 55, 75). The name Ethanim is found in two inscriptions from Cyprus (Land. 91 and 103; Cooke, pp. 69, 89).

[1] *Abīb* = ear: *ḥodesh haabīb* = month of the ears. The month used also to be called *Abīb*, without adding *ḥodesh*.

[2] Gesenius, *Thes.* p. 407.

[3] Gesenius, *Thes.* p. 644; Ewald, *Antiquities of Israel* (Eng. tr., p. 345).

[4] Gesenius, *Thes.* p. 560.

[5] Landau, 16, 183, 228 (cf. Cooke, p. 58).

be interpreted as 'recovery[1]': perhaps this was the month when attention was paid to health and to the care of the body, as with us Italians in autumn, and men rested from the labours of agriculture and navigation. Four inscriptions found in Cyprus, and one found at Carthage, are dated by the month Pha'uloth[2], the month of 'gains,' analogous perhaps to the *Mercedonius* of the Romans[3]. The name Karar seems to have been given to the hottest month of the year[4]. Some other names have been discovered, which are less easy to interpret: such are Marzeaḥ or Mirzaḥ, Mapha', Ḥir, Zebaḥ-shishim: so that the list is now almost complete[5]. Unfortunately, the Phoenician inscriptions, though they give these names of the months, do not give the means of knowing the order in which they were arranged: it has not, therefore, been possible to make use of them to complete the table given above.

90. As has already been mentioned above, when, at the time of Solomon, the forms of worship were organized and

[1] From *raphah* = *sanavit.*

[2] Landau, 91, 94, 104, 105, 223 (cf. Cooke, pp. 69, 73, 83).

[3] Unless it ought to be explained as the month of 'business.' In this case one would have to suppose that some great meeting of business men took place during this month, like the fairs of Leipzig or of Senegallia.

[4] Landau, 98 (Cooke, pp. 77, 144). Perhaps connected with the Assyrian *qarar*, drought or heat.

[5] For these names see the publications of Landau, nos. 6, 18, 99, 105, and 180. For *Marzeaḥ* and *Mirzaḥ* see Jer. xvi. 5 and Amos vi. 7: Gesenius, *Thes.* p. 1280; Cooke, pp. 95, 121 sqq., 303. It is not, however, quite certain that all the Phoenician months were in use among the Jews, and *vice versa.* In Phoenician inscriptions the names Abīb and Ziv have not yet been found. On the other hand, the Phoenician name Zebaḥ-shishim seems to allude to usages which were unknown among the ancient Jews. Further knowledge on the relations between the Phoenician calendar and the earliest Jewish calendar will only be obtained through new epigraphical discoveries. See Cooke, pp. 40, 85; 78, 90, 127 (Ḥir or Ḥiyyar); 59.

amplified, the Phoenician or Canaanite names of months were abolished to make room for others. It is in fact natural to suppose that an attempt was made to separate from the service of the Temple all that could recall the abominations of the enemies of Israel and of Yahwe. The new names were simple numerical names, indicating the position which each month occupied in relation to the beginning of the year. That beginning was now fixed at the new moon of the month formerly called Abīb, which had hitherto been the seventh month, but now became the first: starting from this, they were counted as the second, third, fourth . . . down to the twelfth month[1]. The Pentateuch and the Book of Joshua use this system exclusively, as is to be expected in books that are much later than the age of Solomon. They also project it into earlier times, not only as far back as Joshua and Moses, but even up to the flood, the chronology of which is arranged according to the numerical numbers of the months, as can be seen from the seventh and eighth chapters of Genesis.

If, then, we set on one side the Pentateuch and the Book of Joshua, the earliest mention of these names is to be found in a notice preserved in Chronicles[2], where the allusion is to some celebrated warriors of David: 'These are of the children of Gad, heads of the host; the least was over a hundred, the greatest over a thousand: these were they who passed over Jordan *in the first month*, when it was swollen over all its banks,' &c. This account, if not of

[1] The Chinese too, throughout the long duration of their history, have always called the months by their numerical names. From a similar usage also, the Roman names Quinctilis, Sextilis, September, &c., are derived. The Egyptians used a mixed system in their writings: they divided the year into three seasons (inundation, winter, and summer), in each of which they counted the first, second, third, and fourth month. But in the spoken language they used special names for each month.

[2] 1 Chron. xii. 14, 15.

David's time, may date from the period in which the memorials of his reign were first put in writing, that is, from the age of Solomon.

More certain as regards its date is the mention of the new numerical names made, together with the corresponding Canaanite names, by the author of the description of the Temple and of the festival of its inauguration, in 1 Kings[1]. This double nomenclature shows that in that writer's time both sets of names were still in use[2]. For it does not seem likely that the numerical names were added for the reader's convenience when the Canaanite months were altogether forgotten. However this may be, it is certain that not more than forty years after the consecration of the Temple the use of the numerical names was in full vigour. We have only to read another passage in 1 Kings[3], how Jeroboam, after having established new forms of worship in the kingdom of Israel which he had created, 'made a feast in the eighth month, on the fifteenth day of the month, like the feast that was celebrated in Judah . . . ; and he offered upon the altar which he had made in Bethel, on the fifteenth day, in the eighth month, in a month which he devised of his own heart.'

From this time onwards the citations of the months are more frequent, and are always given by the numerical names. A great sacrifice takes place in Jerusalem in the third

[1] 1 Kings vi. 1, 37, 38; viii. 2. In Chronicles, where the accounts of the building and consecration of the Temple are derived from 1 Kings, the Canaanite names of the months are removed and only the numerical names retained. This suppression removes much of the authority which the indications taken from Chronicles might have for the purposes of the present discussion. But even if no account be taken of these indications, enough remains, not to modify the conclusions we have given.

[2] In the same way and for the same reason the double nomenclature of the months which is found in Zechariah (numerical and Babylonian names) comes from the fact that the two systems of names were both used in his time.

[3] 1 Kings xii. 32, 33.

month of the fifteenth year of Asa, king of Judah[1]. Hezekiah solemnly celebrates the Passover on the fourteenth day of the second month, in the first year of his reign[2]. Similarly Josiah celebrates a solemn Passover in the eighteenth year of his reign, on the fourteenth day of the first month[3]. The various dates concerning the destruction of Jerusalem by Nebuchadnezzar in 586 B.C., are all expressed by the numerical names of months[4], as are those of the death of Gedaliah and of the liberation of Jehoiachin[5]. So again are the numerous dates contained in the prophecies of Jeremiah, Ezekiel, Haggai, Zechariah, and in the Book of Ezra[6], to say nothing of other later books, such as Chronicles, the Book of Judith, and the first Book of the Maccabees.

91. But when at the time of the exile the nation found itself as it were lost in the midst of the Mesopotamian peoples, the names of the lunar months employed by those peoples also came into regular use among the Israelites with the same ease as had the Phoenician or Canaanite names many centuries before. Accordingly, as early as the prophecy of Zechariah (520 B.C.) shortly after the return from exile, in the autobiographical memoirs of Nehemiah[7] (440 B.C.), and in other later writings, for instance

[1] 2 Chron. xv. 10.
[2] 2 Chron. xxx. 2, 15.
[3] 2 Chron. xxxv. 1.
[4] 2 Kings xxv. 1, 8.
[5] 2 Kings xxv. 25, 27.

[6] An apparent exception occurs in Ezra vi. 15, where the Babylonian name Adar is given, instead of saying *the twelfth month*. But it is to be noted that this exception falls in that part of the Book of Ezra which, the original Hebrew being wanting, has been supplied by an Aramaic version (from iv. 8 to vi. 18). It is probable that the original preserved the method used throughout the rest of the book, which is that of the numerical names.

[7] In the Book of Nehemiah, his original memoirs extend from the beginning down to vii. 69, and are resumed from ch. xiii to the end. The rest is a narrative by another writer, who always uses the

both the Books of the Maccabees and the Book of Esther, a new system of names for the months is seen appearing, which Jewish writers had not previously used. There was already reason to suppose that these names were Babylonian in origin: the question was placed beyond the reach of doubt by the recent discoveries of the Assyrio-Babylonian cuneiform inscriptions, through which it has been proved that the names are, with very slight modifications, those used in Babylonia and in lower Chaldaea from time immemorial, which were further adopted by the Assyrians, and in great part also by the Aramaeans of northern Syria and western Mesopotamia.

The relations between these different calendars are clearly set out in the following table, where the first column contains the numerical names of the months according to the Jewish use after the time of Solomon. The second column contains the new names which in the Old Testament appear for the first time with the prophet Zechariah: names which thenceforward always served and still serve in the religious calendar of the Jews. The third column gives the names of the Babylonian calendar, as it is found on numberless cuneiform inscriptions, Assyrian and Babylonian[1]. In the fourth column may be found the names of the lunar months of the Syrians, which were further adopted by the Seleucids in their official calendar, from 312 B.C. onwards[2]. While, however, in the previous columns the first name is also that of the first month of the year, in the Syrian calendar the

numerical names, like the author of the Book of Ezra, with whom he is perhaps identical.

[1] They are here transcribed from the list published by Prof. Sayce: *Trans. Soc. Bibl. Archaeol.* iii. pp. 158–9.

[2] Taken from Ideler, *Handb. d. Chronol.* i. p. 430. The reference here is naturally to the lunisolar reckoning used by the Syrians before they adjusted their calendar to the Roman use and reduced it to a mere variant of the Julian calendar.

first month of the year is the seventh on the list; in other words, while the Jews and Babylonians began the year in spring with *Nisan*, the Syrians began it six months later in autumn with *Tishri*. In the last column are added the corresponding names of our calendar. As we are dealing with lunar months, which begin strictly with a new moon in each case, this correspondence can only be understood as roughly approximate.

Jewish names.		*Assyrio-Babylonian names.*	*Syrian names.*	*Approximate equivalents.*
Numerical.	*Post-exilic.*			
First month	Nisan	Nisannu	Nisan	April
Second ,,	Iyar	Airu	Iyar	May
Third ,,	Sivan	Sivanu	Ḥaziran	June
Fourth ,,	Tammuz	Duzu	Tammuz	July
Fifth ,,	Ab	Abu	Ab	August
Sixth ,,	Elul	Ululu	Elul	September
Seventh ,,	Tishri	Tasritu	Tishri I	October
Eighth ,,	Marḥeshvan	Araḥ samna	Tishri II	November
Ninth ,,	Kislev	Kisilivu	Kanun I	December
Tenth ,,	Tebeth	Dhabitu	Kanun II	January
Eleventh ,,	Shebat	Sabadhu	Shebat	February
Twelfth ,,	Adar	Addaru	Adar	March

The intercalary month, which was necessarily added from time to time to prevent the year from deviating too much from the course of the sun, was put in the thirteenth place, after Adar, and called Veadar, which means *Adar again* (literally *and Adar*).

The comparison of the second, third, and fourth columns, shows that the Jews borrowed their names for the months from the Babylonians, and not, as was for some time believed, from the Syrians. The second and third columns are evidently almost identical, the most important difference being in the eighth position. The Babylonians, while assigning a special name to each month, made an exception in the case of the eighth and called it simply *araḥ samna*,

which is equivalent in their language to 'eighth month.' In Hebrew this would have had to be translated *yeraḥ shemini*. But no account was taken of its meaning, and by a simple phonetic corruption *araḥ samna* became transformed into *Marḥeshvan*[1].

Thus the Israelites, while preserving the order of the months, and without disturbing the ritual of their festivals, gradually accustomed themselves to the Babylonian names of the months, first in civil use, then later, after Titus, in religious use also: finally they consecrated those names in their Calendar, which has been used for fifteen centuries in all Synagogues. In this Calendar, however, the commencement of the year was placed in autumn and at the new moon which began the month Tishri. In consequence of this change the intercalary month Veadar came to occupy the seventh place in the year, whereas it formerly occupied the thirteenth.

[1] This transformation could be all the more easily admitted as in Assyrio-Babylonian the consonants *m* and *v* were represented in the same manner, whence the name of the eighth month could also be read *araḥ savna*, where the consonants do not differ at all from *arḥeshvan*. The addition of the initial *m* is perhaps not of Hebrew origin. As a matter of fact, we find on the celebrated trilingual inscription of Darius I at Behistun, under the Persian form *Markazana*, the name of a month which probably corresponded to *araḥ samna* and to *Marḥeshvan*. This correspondence is not, however, admitted by all scholars, and for the present it is best to leave the question undecided.

CHAPTER VIII

THE JEWISH YEAR

Different commencements of the year at different epochs. — Determination of the Paschal Month. — What the ancient Jews knew about the duration of the year. — Use of the *octaeteris*. — Astronomical schools in the Jewish communities of Babylonia.

92. As the moon served to determine the months, so the sun determined the duration and succession of the years. The Jewish year was a solar year. It was not a conventional year like that of the ancient Egyptians, nor like that of the Mohammedans, because the Israelites made its determination depend on the course of the seasons and on the recurrence of field labours, in the manner which will now be described. That they did so from the first times of the Mosaic legislation is proved by a passage in the First Code[1], where they are told to observe 'the feast of ingathering at the end of the year': this festival it was the custom to celebrate in autumn after the last of all the produce, such as that of the vine and of the late fruits, had been gathered from the fields. In the same code we find further the feast of unleavened bread fixed in the month *Abīb*, that is, in the month of the ears: here we find the feasts and the months connected once more with the year of agrarian labour, and hence with the solar year. Again, the beginning and course of the months in this year were regulated by the phases of the moon: so that there can be no doubt that the calendar of the Jews was at all times lunisolar, like that of

[1] Exod. xxiii. 16.

the Babylonians, Syrians, and Greeks. In such a calculation the year began with that new moon which marked the beginning of the first month. But this beginning point was not always the same for the people of Israel at the different periods of their history.

93. In the First Code, which represents the most ancient stage known to us of the Mosaic legislation[1], the beginning of the year is placed in autumn, after the gathering was finished. 'Likewise observe the feast of harvest, of the first-fruits of thy labours, of that which thou hast sown in thy field; and the feast of ingathering, *at the end of the year*, when thou shalt have gathered in thy labours from the field[2].'

This ancient custom of beginning the year in autumn after the end of the field labours, was abolished at a date which we can now no longer fix with precision. The second Book of Samuel begins the story of the unfortunate Uriah by saying: 'It came to pass *at the return of the year*, at the time when the kings went forth, that David sent Joab and his servants with him and all Israel, and they laid waste the land of the Ammonites and besieged Rabbah[3].' Here the 'going

[1] On the First Code, see the Introduction, § 10.

[2] Exod. xxiii. 16. The words 'at the end of the year' are represented in the Hebrew by *bĕtsēth hashshanah*, where the word *bĕtsēth* is perfectly definite and means 'at the going out.' This command is repeated in the document (Exod. xxxiv. 10–26), which claims to be the text of the ten articles of the fundamental compact, concluded between Yahwe and Israel on Sinai and written (in one place, we are told, by God, in another, by Moses) on the two tables of stone preserved in the Ark. The second half of this document is only a somewhat altered copy of the last section of the First Code, Exod. xxiii. 12–19. Among the alterations occurs the change of *bĕtsēth hashshanah* ('at the end of the year') into *tĕkuphath hashshanah* which Gesenius translates *ad* (post) *decursum anni* (see his *Thes.* p. 1208). This change was probably made when the beginning of the year had already been moved into spring.

[3] 2 Sam. xi. 1. The phrase 'at the return of the year' is represented

forth' can only be understood of a warlike expedition. Now it is well known that in ancient Asia, as among ourselves at the present day, the customary time for going out to war was the spring: a large number of examples of this practice are found on the inscriptions of the warrior monarchs of Assyria[1]. The beginning of the year must therefore have fallen in spring at the date when these words in 2 Samuel were written. If we assume that the writer took them from documents that were contemporaneous with the events or only slightly later, we should have a limit to which the custom of commencing the year with spring must go back, a limit which could not be much later than the reign of David, and in any case is not later than the reign of Solomon.

On the occasion of a war between the kingdom of Israel and Benhadad king of Syria, Elijah says to king Ahab: 'Go and gather thy forces, consider and watch what thou doest: for *at the return of the year* the king of Syria will come upon thee[2].' We are here in the presence of a fact analogous to the one just quoted, and our conclusion from it must be the same. A third example of the same kind is found in 2 Chronicles, referring to the time of Joash king of Judah: 'And it came to pass *at the return of the year* that an army of the Syrians went up against him (Joash), and they came

in the Hebrew by *lithĕshubath hashshanah*, and in the LXX by ἐπιστρέψαντος τοῦ ἐνιαυτοῦ. The same expression is repeated in 1 Chron. xx. 1.

[1] I have examined the inscriptions of several of these monarchs who have left annals giving more details and in more regular form than the majority. Five of them (Asshurnazirpal, Shalmaneser II, Samsi-Adad IV, Sargon, and Asshurbanipal) have furnished me with eleven dates connected with the day and month when they quitted their residences (Nineveh, Calaḥ, or Babylon) for distant warlike expeditions. Of these dates three belong to the month Airu (=April to May), seven to the month Sivanu (=May to June), one to the month Abu (=July to August). It will be seen that ten out of eleven dates belong to the spring.

[2] 1 Kings xx. 22, 26. Here too we have *lithĕshubath hashshanah*.

to Judah and Jerusalem,' &c.[1] In two other places in Chronicles[2], mention is made of a solemn Passover celebrated by Hezekiah *in the second month*, and of another solemn Passover celebrated by Josiah *in the first month*. As the Passover is inseparably connected with spring, it may be inferred from these two passages that the beginning of the year was in spring during the reign of Hezekiah and also of Josiah.

Lastly, an admirably clear indication of the beginning of the year in the closing period of the kingdom of Judah is found in Jeremiah[3], where he relates that in the fifth year of Jehoiakim son of Josiah 'the king was sitting in his winter palace, in the ninth month, and a burning fire-pan was before him.' Now supposing that in Jeremiah's time the year began in spring with April, the ninth month came to an end in December or January, a date which thoroughly explains the king's residence in the winter palace and the burning fire-pan.

94. These passages seem to prove satisfactorily that the custom of beginning the year in spring was not imported from Babylon after the destruction of the first Temple, but was certainly in vogue for some centuries before, and probably as early as the time of Solomon[4]. That this custom was in full

[1] 2 Chron. xxiv. 23. The words here are *tĕkuphath hashshanah*.

[2] 2 Chron. xxx. 2, 15; xxxv. 1. [3] Jer. xxxvi. 22.

[4] Wellhausen (*Prolegomena to the History of Israel*, Eng. tr., p. 108) is of opinion that the year began with autumn throughout the period of the kings. 'Deuteronomy,' he says, 'was found in the eighteenth year of Josiah, and there was still time for the Passover to be celebrated in the same year, according to the regulations of that book: this is only possible if the beginning of the year be supposed to have fallen in autumn.' I may observe in the first place that the Passover was celebrated, not on the first day of the year, but on the fifteenth. Fourteen days were therefore available for reading the book and giving the directions necessary for a solemn and general Passover throughout the small kingdom of Judah. Further, from the eighteenth year of Josiah to the fifth year of Jehoiakim is an interval of seventeen or

vigour when the Jewish authors of the exile and of later times wrote, and that the Passover was understood by all to be fixed at the full moon of the first month and in the month of the early corn, is shown by a mere glance at the prophecies of Jeremiah, Ezekiel, and Zechariah, at the Books of Kings, at the Priestly Code, and at the Book of Joshua. The two last-named books not only follow this use for the times in which it was actually and systematically employed, but extend it by anticipation to the more ancient periods in which the beginning of the year is known by incontestable evidence to have been placed in autumn. The tradition gradually formed itself that the rule for commencing the year from the Paschal moon had already been laid down by Moses, even before the Jews quitted Egypt, as may be seen in Exodus xii (certainly written some centuries after the event): 'This month (that of the exodus from Egypt) shall be for you the beginning of months, the first of the months of the year[1].'

95. We have expressed the opinion above, that the transference of the commencement of the year from autumn to spring was made in the time of Solomon. An argument in favour of this view may be derived from the fact that, just at this time, the forms of worship were arranged in a more orderly way, with a splendour and elaboration which were wholly new. The calculation of seasons was intimately bound up with religion. The change of the commencement of the year and the abolition of the Canaanite names of the months (effected, as has been shown in § 90, just at this

eighteen years only, and it is certain, as has been shown above, that the latter year commenced in spring. One would have to suppose that a reform of the calendar was carried out during this interval in order to obey the new religious code. But in Deuteronomy as known to us there is certainly no mention of the point at which the year ought to begin.

[1] Exod. xii. 2; in manifest contradiction with xxiii. 16, and xxxiv. 22.

epoch) were probably parts of a new organization which was designed to make of the worship of Yahwe something exclusively national and absolutely distinct from the religions of the neighbouring peoples.

For religious purposes the commencement of the year was kept in spring, at least till the destruction of the second Temple, and till the complete dispersion of the nation. Yet even as early as the period of Persian rule, the long contact with the Aramaic peoples, and later, the influence of the kingdom of Syria, led to the gradual introduction in civil use amongst the Jews also of the fashion of commencing the year, as the Syrians did, in autumn, so that they returned to the old rules borrowed from the Canaanites.

When that happened, cannot be said exactly; but it is certain that the method of computing in this way for civil purposes is already found in the writings of Nehemiah, who acted as civil official of Artaxerxes I in Jerusalem[1]. The custom of commencing the beginning of the seventh month with the sound of the trumpet seems to show that the intention was to inaugurate the civil year in this manner. This custom is in fact unknown in the legislation earlier than the exile, and is found only in Leviticus (xxiii. 24) and Numbers (xxix. 1), which must be considered as having only been definitely redacted after the time of Nehemiah. We are led

[1] Nehemiah relates in his memoirs (Neh. i. 1) that, in the twentieth year of Artaxerxes, in the month Kislev, he learned from Hanani the wretched state of affairs in Jerusalem; and that, after various incidents, in the month Nisan of the same twentieth year (ii. 1) he obtained permission from Artaxerxes to betake himself to Judah to procure a remedy. Now it is easy to see that, supposing the years were counted from the spring, beginning with Nisan, Nehemiah's dates would involve a contradiction. We must therefore suppose that Nehemiah began the year with Tishri, according to the civil use, just as the names of the months employed by him are those of the civil year. The procedure was suitable in the case of a civil official like Nehemiah.

to the same conclusion by considering the manner in which the repose of the land in the sabbatical year is prescribed (Lev. xxv. 4): 'In the seventh year there shall be a sabbath of rest for the land; thou shalt not sow thy field in it, nor prune thy vineyard; thou shalt not reap that which groweth of its own accord . . . and thou shalt not gather the grapes of the vine that thou hast not pruned: it shall be a year of rest for the land.' Here, as in the old law of the First Code (Exod. xxiii. 11, 12), it is clear that the reference is to the sowing, reaping, and vintage of one and the same agricultural year, and such a year could only begin in autumn. The same observation applies also to the Year of Jubilee, which was ordered to begin on the tenth day of the seventh month, in this case also with the sound of the trumpet (Lev. xxv. 9–12), and lasted from the autumn of one year to the autumn of the next. However, the numbering of the months was always that of the religious year, which began in spring with the first month or with Nisan, at any rate so far as the periods covered by the Old Testament are concerned. But the habit of commencing the civil year in autumn with Tishri after the manner of the Syrians, continued to prevail more and more, and even lasted on under the Seleucids, under the Hasmoneans, and in the later Jewish schools; it ended by also prevailing in the religious calendar systematized by the Rabbis of the fourth century of the Christian era, a system which is still in use at the present day.

96. It has already been indicated above how the year of the Israelites from the earliest times was regulated according to the course of the sun, so as to be renewed in a manner corresponding to the changes of the seasons (§ 92). We must now examine this point with somewhat greater precision, and show what position in the Jewish year was occupied by the festivals: since these festivals were of an agricultural character, and hence were inseparably bound up with the

changes of the atmosphere and with the annual course of the sun.

In the first month, in the evening which concluded the fourteenth and began the fifteenth day, the moon being full[1], the Passover was celebrated, and the festival continued for twenty-four hours, down to the evening of the following fifteenth day. With the fourteenth evening of the first month began also the seven days of unleavened bread, which lasted for seven days, down to the twentieth evening from that of the new moon. On whichever of the seven days fell after the sabbath, the offering of the *'omer* ['sheaf'] was made[2]. A sheaf of new ears was presented as first-fruits, with the rites prescribed in Levit. xxiii. 10–13. Here we have the first connexion of the Jewish calendar with the seasons; by this day, that is to say, falling after the first half of the first month, the ears of barley were supposed to be completely formed, or at any rate sufficiently formed, in so far as it was not necessary to have them completely ripe and dry. Barley begins to ripen in Palestine with the beginning

[1] It must not be forgotten that the new moon beginning the month coincided with the observation of the lunar crescent in the evening, which was one or two days later than the astronomical new moon, i.e. the actual geocentric conjunction of the moon with the sun. Hence the full moon took place more often on the fourteenth than on the fifteenth day.

[2] The rules given in the Pentateuch for the offering of the *'omer* are commonly understood as meaning that this offering was brought immediately after the Paschal day, i.e. on the sixteenth day of the first month. Josephus already takes this view, and almost all the Rabbinical writers. I have kept myself strictly to what is prescribed in Lev. xxiii. 11 and 15. The First Code and Deuteronomy give no regulation on the subject. They do not mention the offering of the *'omer*, and Deuteronomy only orders fifty days to be counted, starting 'from the beginning of harvest,' to celebrate the feast of firstfruits at the end of them. The First Code seems to suppose that the feast of firstfruits ought to be celebrated after the harvest is finished. The ordinance of Leviticus (not too clearly expressed, as the discordant interpretations prove) belongs perhaps to a date later than the exile.

of April, and in the lower and warmer parts the cutting is begun at the end of the same month. Hence we see that the first new moon, which began the first month and the Jewish year, could only take place in the last days of March at the earliest, and the sacrifice of the *'omer* at the earliest only some days before the end of the first half of April.

After this sacrifice it was permissible to begin reaping and living on the new grain. The cutting of the wheat fell some time after that of barley; besides which, the dwellers in the colder climate of the higher ground were bound to be later; the harvest was consequently not finally finished till the second half of May. There followed on the harvest the feast 'of the weeks,' the fixed date for which was seven weeks or forty-nine days after the day of the *'omer*[1]: 'From the day of the offering of the *'omer* ye shall number seven complete weeks; unto the day after the seventh week ye shall count fifty days.' On the fiftieth day took place the offering 'of the Weeks' and the festival of the harvest, which might be delayed, according to years and districts, as late as the end of June. Here is a second connexion which fixed the Jewish calendar in relation to the seasons. The fiftieth day from the offering of the *'omer*, which fell in the first half of the third month (putting it generally, from the sixth to the thirteenth of the month), had to come to an end with the harvest completed.

No other festivals, except the regular ones of sabbaths and new moons, occurred in the Jewish calendar till the seventh month. But on the first day of the seventh month there was celebrated with the sound of the trumpet the commemorative festival of *tĕru'ah*, or festival 'of joyful noise' [R. V. 'blowing of trumpets'][2]. Some critics have

[1] Lev. xxiii. 14–16.

[2] *Shabbathon zichron tĕru'ah* (Lev. xxiii. 24). The word *tĕru'ah* is

wished to recognize in this the memory of the ancient custom of joyfully celebrating the beginning of the year with every kind of noise, when it fell in autumn and coincided with the vintage or followed it by only a short interval. The corresponding festival at the beginning of the first month was never celebrated; in the new system of months the beginning of the year was not marked by any special ceremony other than what was usual on all days of new moon.

In the seventh month, exactly on the full moon or fifteenth of that month, the third of the great annual festivals began. This was anciently called the feast of Ingathering, and later the feast of Tabernacles. It lasted seven days, from the fifteenth to the twenty-first, and was celebrated as a thanksgiving after the gathering of grapes and olives had been finished. Its date regularly fell in our October, and at this time the harvests of field and vineyard were supposed to be finished: which gives us a third connexion between the Jewish calendar and the seasons and course of the sun.

97. So then this calendar, both in its old Canaanite form and in the revised form now described, was inseparably connected with the course of the sun. But, to maintain it in order, it was not enough simply to count twelve moons in a year as the Mohammedans now do. It was necessary to intercalate a thirteenth moon from time to time. To find rules for making intercalation without deviating too far from the course of the sun and moon, was a problem which long exercised, as is well known, all the acumen of the Babylonian and Greek astronomers. The illustrious names of Harpalus, Cleostratus, Meton, Eudoxus, Calippus, Hipparchus, are connected with it, and its solution required an exact study of the solar and lunar periods. How did the learned in Israel solve this problem?

derived from *ru'* meaning *vociferatus est, jubilavit, tuba cecinit*, and is translated by *laetus clamor* (Gesenius, *Thes.* p. 1277).

The Old Testament contains no notice which might serve to enlighten us on this point. The months are always counted as twelve, and there is never an allusion to an intercalary month. There are even indications which would seem to exclude its existence. In the Books of Chronicles [1] are registered the twelve divisions of the Jewish army which are said to have performed their turns of service in the time of David, each for a month; the months are counted from one to twelve without any hint of an intercalary month, during which the service would have remained without provision. Similarly, twelve ministers are mentioned in 1 Kings [2], each of whom had to provide for the maintenance of the household of Solomon during one month: here, too, no indication is given on whom the charge would fall, should a thirteenth month occur. These facts have induced some scholars to conclude that the Jewish months were not lunar months; but this hypothesis is contrary to the evidence of too many unmistakable passages. The very nature of circumstances makes it necessary for us to assume that from time to time the lunar periods of the year were counted as thirteen. 'Even if,' as Ideler says [3], 'no passage in the Old Testament mentions an intercalary month, we must nevertheless believe in its existence; for it is absolutely necessary to add a thirteenth month from time to time to the twelve of the lunar year, if we do not wish the beginning of the year to go on being displaced and to recede gradually round the whole circle of the seasons.' To omit the intercalation would produce a year like that used by the Mohammedans, whose beginning completes the circle of the seasons about three times in a century, and such a system would conflict with the fixed relation in which the Hebrew

[1] 1 Chron. xxvii. 1–15. [2] 1 Kings iv. 7–20.
[3] Ideler, *op. cit.* i. 488–9.

months have been shown above to stand to the seasons and to the course of the sun.

The proceeding adopted to prevent the months from deserting the corresponding seasons could only be of a very simple character. A probable allusion to it is perhaps to be found in Deuteronomy at the beginning of ch. xvi, where the words are: 'Observe the month of ears and offer the Passover to Yahwe.' Here the word 'observe' (in Hebrew *shamor*) means 'watch, pay attention.' As a matter of fact it was sufficient, in order fully to attain their object, to watch the progress of the months after blossoming time, when the ears began to be formed. It was then easy to determine, at the end of the twelfth lunar period of the preceding year, whether, if the new year began with the new moon following, the ears would be sufficiently ripe fifteen or twenty days later to make the offering of the *'omer*. If this was so, the new year was made to begin at the next new moon; in the opposite case its commencement was deferred till the succeeding new moon. This method of fixing the beginning of the new year and the date of the Passover, though we should call it empirical and experimental, was quite appropriate to an essentially agricultural people, and it did not require them to trouble themselves with calculations about the course of the sun and of the moon. With this system, however, the determination of the beginning of the year came to depend not only on the connexion between the periods of the sun and of the moon, but also to a great extent on the meteorological condition of the preceding months and on the progress of the vegetation in each year; which could not have failed to produce some irregularity in the distribution of the thirteenth or intercalary month. To sum up,—when the dates at which barley, wheat, and vines ripen in Palestine are considered, it may be maintained that as a rule the beginning of the year fell on the first,

sometimes on the second new moon after the spring equinox; this caused the Passover to fall from the first ten days of April to the first ten days of May, the feast of Weeks and the end of harvest from the last ten days of May to the last ten days of June, the feast of Ingathering for the most part within October. In the colder districts of Palestine the vintage takes place about the end of September [1]. When further, in spite of all precautions, the inclemency of the season was such as not to allow the offering of the new ears on the fifteenth day after the year had begun, there was still left open the permission to take advantage of a last and infallible expedient; it was permitted, that is to say, to begin the Passover on the fourteenth day of the *second* month. Of this permission, if we are to believe the Chronicler, Hezekiah availed himself for the solemn Passover celebrated in the first year of his reign [2].

98. It remains for us to examine what knowledge the Jews had of the duration of the tropic year, that is, of that year which governs the return of the seasons. Some evidence on this subject is furnished by one of the writers in Genesis, where he assigns to the life of the patriarch Enoch, before he was taken away by God, the duration of 365 years, since it is hard to believe that this number is put here by chance [3]. But even if that were so, we cannot doubt that this writer knew the year of 365 days. In fact, he makes the flood begin in the 600th year of Noah's life, on the seventeenth day of the second month; and the definite drying of the earth and end of the flood he puts in the 601st year of Noah's life, on the twenty-seventh day of the second month [4]. These months are certainly those

[1] Volney, *Voyage en Syrie et en Égypte* (Paris, 1792), p. 192.

[2] 2 Chron. xxx. 2, 3. A law for similar cases is given in Numbers ix. 10, 11.

[3] Gen. v. 24.

[4] Gen. vii. 11, and viii. 4.

of the Jewish calendar, that is to say, lunar periods. The flood would therefore have lasted for twelve moons and eleven extra days. It is hard not to recognize here the intention of making the flood last for an exact solar year; for if 354 days be assumed for the duration of twelve moons (they amount in reality to 354 days, 9 hours) the total duration of the flood comes to 365 days [1].

99. When the Israelites began to find themselves dispersed in various regions of the earth far distant from each other, such as Babylon and Egypt, it became impracticable to employ the method previously used of determining the beginning of the year by watching the ripening of the new ears of corn. Those who lived in Babylon could without difficulty follow the official computation of the Babylonians; and we may suppose this to have been sufficiently well adapted to the Jewish rules, in the conditions of times which did not render the offering of the sacrifices obligatory. The Jews of Alexandria, however, could not adopt a similar course, for the calendar of the Egyptians was of little service to them, and that of the Romans of still less. They were always obliged to obtain the requisite information from the Sanhedrin in Palestine. At that time, according to the account of Julius Africanus [2], they adopted the *octaeteris* of the Greeks, supposing it equal to eight years of $365\frac{1}{4}$ days, and to ninety-nine moons of $29\frac{17}{33}$ days each.

[1] In the pseudepigraphic Book of Enoch and in the Book of Jubilees (both written at dates not far from the beginning of our era) very crude ideas are still found on the elements of the lunisolar calendar. The Book of Enoch supposes that the lunar year is one of 354 days exactly, the solar year of 364. [R. H. Charles, *Book of Enoch*, p. 187 sqq.]

[2] Jul. Afric. apud Syncellum (*Chronogr.*, p. 611, ed. Bonn.). Approximately the same statements are repeated by Cedrenus (i. 343, ed. Bonn.). Some idea (even though a very imperfect one) of the *octaeteris* was already possessed by the author of the Book of Enoch, who discourses about it in ch. 74.

But this calculation was very imperfect; adapting, as was natural, their solemnities to the course of the moon, they were quickly in disagreement with the course of the sun and with the seasons[1]. The boast of giving a definite basis for the calculation of the festivals and for the observance of the rites was reserved for the Jews of Babylonia, the descendants of the ancient exiles whom Nebuchadnezzar had deported thither. After many and various vicissitudes they found favour, or, at any rate, benevolent toleration, under the Arsacids and the first Sassanids; the Jewish communities of the Euphrates flourished, and along with the development of material prosperity a vigorous intellectual growth also took place. In the first half of the third century we find astronomy cultivated and taught in the schools of Nahardea and Sura by distinguished professors such as Rabbi Samuel[2] and Rabbi Adda, who not only were in possession of exact fundamental principles concerning the motion of the sun and moon, but also knew the Metonic cycle. Were they the

[1] According to the course of the sun eight years represent approximately 2,922 days, while ninety-nine moons actually give 2,923½. Counting time by moons involved an error of one and a half days in eight years or fifteen days in eighty years, and the calculation was bound to deviate to that extent from the real course of the seasons. Ideler (*op. cit.* i. 571–2; ii. 243 and 615) alludes also to the use which, according to some pieces of evidence, the Jews are said to have made of a period of eighty-four years. The notices, however, are of too uncertain a character for any stress to be laid on them: it is not mentioned at all in the Talmud or in any of the Rabbinical writers. Schürer (*Geschichte des jüdischen Volkes im Zeitalter Jesu Christi*, ed. 4, i. 751–5) [cp. Eng. tr. of earlier edition, I. ii. 369] has collected various notices as to the method by which the Jews determined the intercalation of the thirteenth month, in the centuries immediately before and after the beginning of our era.

[2] It is related of Rabbi Samuel that he said, speaking of shooting stars: 'Known to me are the ways of heaven, even as the ways of the city of Nahardea are known: but what a falling star is, that I know not.'

heirs of the dying astronomy of Babylon, or had they learned from the Greeks? However that may be, these masters already knew how to reduce to a sound practice the calculation of the new moons and of the equinoxes. Herewith the most urgent needs were supplied, and the bases of the existing Jewish calendar laid, which is believed to have been definitely systematized by Rabbi Hillel about the middle of the fourth century [1].

[1] On the origin and history of the Jewish calendar, with which we cannot occupy ourselves here, see Ideler, *op. cit.* i. pp. 570–83.

CHAPTER IX

SEPTENARY PERIODS

The Babylonian lunar week and the free Jewish week. — The repose of the Sabbath. — The year of liberty. — The year of remission. — The Sabbatic Year. — Epochs of the Sabbatic Year. — The Jewish Jubilee. — Questions relating to its origin and use.

100. The length of the monthly period determined by the lunar phases was not easily adapted for all the usages of social life. Various peoples which have reached a certain degree of civilization, have felt the necessity of dividing time into shorter intervals, whether for the regulation of religious festivals and ceremonies, or so as to have an easily observable order for markets and other events occurring at distances of only a few days apart. Hence the origin of cycles that include a small number of days. Thus we find the period of *three* days among the Muyscas on the plateau of Bogota, of *five* days among the Mexicans before the Spanish conquest, and the week of *seven* days among the Jews, the Babylonians, and the Peruvians at the time of the Incas. The period of *eight* days is known as used by the Romans in the republican times (*nundinae*), and lastly that of *ten* days which was in regular use among the ancient Egyptians and among the Athenians. In the majority of cases, these periods were so arranged as to divide the lunar month into equal or almost equal parts. Thus the ten-day period was, among the Egyptians exactly, among the Athenians approximately, the third part of a whole month. The week of the

Babylonians and of the Peruvians was fixed by the quarters of the lunar period. And among the Mexicans the five days were a quarter of their month, which is known to have consisted of twenty days only.

101. As the length of a lunation is about $29\frac{1}{2}$ days, a quarter of it comes to $7\frac{3}{8}$ days. But as men cannot proceed in this matter otherwise than in whole numbers, they are obliged to keep to the nearest number of whole days. Hence arises the period of seven days, representing the nearest equivalent to a quarter of a lunation. The first and most ancient form of the week was accordingly to count successively seven, fourteen, twenty-one, and twenty-eight days from the beginning of the month (or from the new moon), leaving one or two days remaining over at the end, so as to recommence in a similar manner the calculation from the commencement of the next new moon.—This form of week, bound up with the lunar phases, was anciently in use among the Babylonians, as appears from a portion of a Babylonian calendar preserved in the British Museum[1]. In this precious record, which unfortunately contains one month only, the festivals and sacrifices to be celebrated are indicated, and the part the king ought to take in them. The seventh, fourteenth, twenty-first, and twenty-eighth days of the month are marked as *umu limnu*, that is, as unlucky days; and, at the side of those days, various things are noted which might not be done on them. The king had to abstain from eating certain kinds of food, from attending to decisions affecting the affairs of state, from going out in his chariot. The priests could not utter oracles, the doctor could not lay

[1] Published in the original in Rawlinson's *Cuneiform Inscriptions of Western Asia*, vol. iv. tab. 32 and 33. Translation by Sayce, *Records of the Past*, first series, vii. 157–68. [See also Jastrow, *Religion of Bab. and Ass.* (1898), p. 376 ff.] Commentary by Zimmern, *KAT.*[3] p. 592 [untranslated]. The document is the transcript of a more ancient copy, made by order of Asshurbanipal and found in the ruins of Nineveh.

his hand on a sick person. Men were not, however, forbidden to attend to their private affairs, to buy and sell[1].

102. From the week thus bound up with the lunar phases it was easy to pass to a week which was purely conventional and rigorously periodic, such as we now use. The former was in fact subject to all the irregularities and uncertainties which accompany the determination of the new moon: it was natural to resolve this difficulty by making a perfectly

[1] This is clearly shown by the dates of the Babylonian contracts. Boscawen (*Trans. Soc. Bibl. Archaeol.* vi. 1–78) has transcribed the dates of about 400 documents taken from the archives of the Babylonian business firm, Egibi and Sons. By classifying these dates according to the days of the month, I find that the number of contracts concluded on the seventh, fourteenth, twenty-first, and twenty-eighth days, is not at all smaller than the average. These same documents show that a real and actual abstention from business matters only took place on the nineteenth day of each month, i.e. the forty-ninth day (7×7) counting from the beginning of the preceding month. This nineteenth day is also marked, in the Babylonian Calendar which has been cited above, as *umu limnu*, i.e. *dies nefastus*, and all the rules laid down for the seventh, fourteenth, twenty-first, and twenty-eighth days are valid for the nineteenth day also. But, in addition, contracts were not concluded on the nineteenth day. Perhaps therefore we must understand the matter thus: the seventh, fourteenth, twenty-first, and twenty-eighth days were to be regarded as *nefasti* in the palace, but outside the palace, only for works of magic or divination; while the nineteenth day was considered *nefastus* for all purposes.

It does not appear that the days in question were days of rest among the Babylonians. And it does not appear that they employed the word *shabattu* to describe them. It is more probable that they meant by it 'a day of pacification' (of a deity's anger). The coincidence derived from the resemblance between the two words affords no proof in favour of a real weekly rest or Sabbath among the Babylonians.

[On the use of *shabattu* in Assyrian, see the article SABBATH in Hastings's *Dictionary of the Bible*, iv. 319[a], or Zimmern, *KAT.*[3] p. 592 ff. Since these articles were written, a lexicographical tablet belonging to the library of Asshurbanipal has been discovered by Mr. Pinches, in which *shapattu* is given as the name of the fifteenth day of the month, i.e. (presumably) of the day of the Full Moon: see Zimmern in *Zeitschr. d. Deutschen morgenländ. Gesellschaft*, 1904, pp. 199 sqq.]

uniform period of seven days, free from any dependence on the moon or on any other celestial phenomenon of any kind. In this way it was easy to render the use of the week public and popular, by connecting it with some civil or religious act, for instance with a festival or a market, which was always held on the same day of each period, or even with both a festival and a market. Whether the Jews arrived at this conception through their own reflection or received it from others, it is no longer possible to decide. The institution of the week is certainly to be ranked among the most ancient recorded usages of the Jewish nation, and the Sabbath[1] as a day of enforced rest is found mentioned in the most ancient documents of the law, such as the two Decalogues[2] and the First Code[3]; as also in the Books of Kings during the time of the prophet Elisha[4], and in the prophecies of Amos and Hosea[5]. Its origin may possibly go back to the first beginnings of the Jewish people, and may well be even earlier than Moses. Carried by the Jews into their dispersion, adopted by the Chaldaean astrologers for use in their divinations, received by Christianity and Islam, this cycle, so convenient and so useful for chronology, has now been adopted throughout the world. Its use can be traced back for about 3,000 years, and there is every reason to believe that it will last through the centuries to come, resisting the madness of useless novelty and the assaults of present and future iconoclasts.

103. It does not appear that the Jews gave special names to the days of the week, except to the Sabbath, which was regarded as the last day of the seven, a suitable position

[1] *Shābath* = cessavit (ab aliquo opere), feriatus est, quievit: *Shabbath* = quies, sabbatum.

[2] For the first Decalogue, see Exod. xx. 8–11 and Deut. v. 12–15. For the second, Exod. xxxiv. 21.

[3] Exod. xxiii. 12.

[4] 2 Kings iv. 23.

[5] Hosea ii. 11; Amos viii. 5.

for the rest which ought to follow after labour. No trace of such names appears in the books of the Old Testament. From the titles, however, which are found at the head of certain Psalms in the version of the LXX and in the Vulgate[1], it may be argued that, at any rate in the centuries immediately preceding the Christian era, the Jews indicated each day by its numerical name, designating the day following the Sabbath as the first day, its successor as the second, and so on. The sixth day, which preceded the Sabbath, was described as 'the day before the Sabbath'; and at a later date it was called by the Hellenistic Jews παρασκευή or 'preparation' for the Sabbath, which corresponds to our Friday. Similar indications are found in the New Testament[2].

104. Many believe that the week had its origin from the seven stars visible to the naked eye which traverse the celestial zodiac. For the ancient astronomers and astrologers these stars were the sun, the moon, and the five larger planets, Mercury, Venus, Mars, Jupiter, and Saturn. On this subject we may observe first that to associate the sun and the moon, stars giving so much light and of so appreciable a diameter, with the five so much smaller planets just mentioned, is not what might be expected of the primitive systems of cosmography. To perceive their common characteristic, which is periodic movement within the zodiacal belt, an accurate and sufficiently prolonged study is required.

[1] In these titles the Psalms are mentioned as to be sung on particular days: Psalm xxiv on the first day after the Sabbath; Psalm xlviii on the second day after the Sabbath; Psalm xciv on the fourth day after the Sabbath; Psalm xciii on the day preceding the Sabbath. These indications are absent in the Hebrew text of the Psalms, a fact which seems to prove that their origin is later than the composition of the Psalms themselves.

[2] Matt. xxviii. 1; Mark xv. 42, xvi. 9; Luke xxiii. 54, xxiv. 1; John xx. 1.

It is also necessary to have recognized that Mercury and Venus as morning stars are the same as Mercury and Venus as evening stars. All this seems to have been known to the Babylonians, at any rate at the time of Nebuchadnezzar, who boasts in one of his inscriptions of having raised a temple to the seven rulers of heaven and earth[1]. And yet, in spite of this, the week of the Babylonians, as was seen above, was not a planetary week like our own, but was founded upon quarters of lunations. In the Babylonian Calendar of which we have already spoken, there is no indication either of the planets or of the corresponding deities. On the other hand, the oldest use of the free and uniform week is found among the Jews, who had only a most imperfect knowledge of the planets. The identity of the number of the days in the week with that of the planets is purely accidental, and it is not permissible to assert that the former number is derived from the latter.

105. The numerous relations, whether peaceful or warlike, of the Jews with Rome, when she had succeeded to the inheritance of the kings of Syria, had the effect of making the seven days' week and the Sabbath known to the Romans even before the Empire was established. Horace, Ovid, Tibullus, Persius, Juvenal, speak of the Sabbath as of something universally known; and Josephus could write that in his time there was no city, whether Greek or non-Greek, where the Jewish habit of celebrating the Sabbath was unknown[2]. About the same time men began already to attribute to the various days of the week those same names of pagan divinities which are still employed at the present day, with only small alteration, among all the neo-Latin peoples, and are also used among the

[1] Ball, *The India House Inscription of Nebuchadnezzar the Great* (in *Records of the Past*, 2nd Series, vol. iii. pp. 102–23).

[2] *C. Apionem*, ii. 39.

peoples of Germanic origin, though in a form modified according to northern mythology. Tibullus, in the third Elegy of his first Book, already calls the Sabbath the day of Saturn and a day of bad omen (lines 17, 18):—

> Aut ego sum causatus aves, aut omina dira,
> Saturni aut sacram me tenuisse diem.

Not long ago the following inscription was found scratched on the wall of a dining-room in Pompeii[1]:—

SATVRNI
SOLIS
LVNAE
MARTIS
IOVIS
VENERIS

This gives the days of the week in the order still adopted at the present time, with the omission, however, of Wednesday, which is no doubt an accidental error. So then these names were already known and generally used before the destruction of Pompeii, which took place in 79 A.D.

106. The astrological origin of these names is too familiar to require relating here. Their order depends on two suppositions. The first is the division of the *nychthemeron* into twenty-four hours. This is enough by itself to exclude the possibility that their invention may be due to the Babylonians, since we have already seen that they divided their *nychthemeron*, not into twenty-four hours, but into twelve *kaspu*. Secondly, the order of these names is closely connected with the order of the seven planetary spheres adopted by Ptolemy, and after him by almost all astronomers and astrologers down to Copernicus. This order, commencing with the highest planet and descending to the lowest, is: Saturn,

[1] *Atti della R. Accademia dei Lincei*, anno 1901, *Notizie degli Scavi*, p. 330.

Jupiter, Mars, Sun, Venus, Mercury, Moon. Now the first notices which we possess of this arrangement do not go back much beyond the first or second century before our era[1]. It is improbable that the application of the names of the planetary divinities (which are Greek divinities) to the days of the week is much older. We are indebted for these names to mathematical astrology, the false science which came to be formed after the time of Alexander the Great from the strange intermarriage between Chaldaean and Egyptian superstitions and the mathematical astronomy of the Greeks[2]. The division of the *nychthemeron* into twenty-four hours certainly came from Egypt; the order of the planetary spheres which has been described above is probably the result of neo-Pythagorean speculations, as I hope to show on another occasion.

107. Has the progress of the week always been regular and never been interrupted throughout the centuries, in such a way as always to place an interval of seven days from one Sabbath to another, or a number of days which is some multiple of seven? It is clear that an interruption of its use, even for a not very long time, might have disturbed the uniformity of the succession, and in consequence a Sabbath occurring after the interruption could be separated from a Sabbath occurring before it by a number of days which is not a multiple of seven. Not all the materials for settling

[1] If we were to believe Macrobius, this order would already have been adopted by Archimedes, and hence would go back to the third century B.C. See his *Commentarium in somnium Scipionis*, i. 19; ii. 3. The authority of Macrobius in such a matter does not seem to be of much weight. Even, however, if it be accepted, not much would result; in no case can the inference be drawn from it that the conception of the week arose from the seven planets.

[2] On the history of the week in east and west, Ideler may be consulted with advantage (*op. cit.* i. 60, 87, 178–80, 480–2; ii. 177–9; and elsewhere).

this question are in existence, or at any rate, not all have the degree of certainty which one could desire: recourse must in part be had to conjecture. It is certain that an institution of such antiquity, and sanctioned by all the religious codes of the Jews, must have been observed with the utmost care before the Babylonian exile. During that exile the Jewish community of Babylon seems to have attained a remarkable degree of cohesion and authority: so much so that it could continue a vigorous existence for more than a thousand years, down to the persecutions of the last Sassanids. In this community, where the existing Jewish calendar had its origin, and the Babylonian Talmud was composed, it cannot be doubted that the Sabbath continued to be observed, at any rate so far as concerns complete abstention from any servile labour; and for this purpose the fact of residence in a foreign land offered facilities for profiting by the aid of non-Jewish servants. Hence it cannot be doubted that the Sabbatic interval has successfully traversed without interruption, not only the period from the destruction of the first Temple to the building of the second, but also the time down to the destruction of the latter by Titus in 70 A. D. By this date, however, the Sabbath had already penetrated into the habits of the Roman world, and into Christianity itself, where no difficulty was felt from the first in accepting a calculation on which the life of the Redeemer and its last incidents had been regulated. The only important alteration took place when, instead of the Sabbath, the day of the Sun was adopted as the festal day, and henceforward it was called 'the day of the Lord' (ἡμέρα κυριακή, dies Dominica), owing to the resurrection of Christ having occurred on that day. This change, the first indications of which are found in St. Justin Martyr's *Apology*, exercised no influence on the periodical recurrence of the seven days' weeks, and only caused this consequence that the repose of

the Jews and the weekly festival of the Christians were no longer celebrated at the same time. But for the one, as for the other, the Sabbath fell on the same day. Nor was any change effected in the days of Constantine, when for the names *dies Lunae, dies Martis, dies Mercurii*, &c., an attempt was made, though with only small success, to substitute the less pagan titles *feria secunda, feria tertia, feria quarta*, &c. After Constantine, the week came definitely to form an essential part of the Christian liturgy, and thenceforward no further occasion for alteration arose. The week pursued its course undisturbed even at the time when the Christian calendar was reformed by Gregory XIII in 1582. Jews, Christians, and Mohammedans are perfectly in agreement on the dates of the Sabbath, although they celebrate their weekly festivals on different days, namely, the Mohammedans on Friday, the Jews on Saturday, and the Christians on Sunday. Hence the week has become a golden thread which often serves to guide the historian through the uncertainties of chronology.

108. Periods of Seven Years. Even from the first times of the Mosaic legislation, the interval of seven years was used to regulate certain religious or civil ordinances. One of these concerned the enforced liberation of slaves of Jewish nationality in the seventh year of their bondage. We read in the First Code[1]: 'When thou hast bought a Hebrew slave, he shall serve thee for six years; but in the seventh year he shall go out free without paying for his redemption.' This arrangement is repeated together with strong exhortations in Deuteronomy[2]; it is considered as a duty by Jeremiah[3], and is again mentioned in Ezekiel[4], from whom we also know that this seventh year was called 'the year of liberty.'

In this case the septennial period was a mere interval, the

[1] Exod. xxi. 2.
[2] Deut. xv. 12–18.
[3] Jer. xxxiv. 13, 14.
[4] Ezek. xlvi. 17.

beginning and end of which varied according to persons and places. On the other hand, a fixed septennial period, a true *heptaeteris* common to the whole Jewish people, exists in the period which prescribed the remission of debts. Perhaps this, too, was not originally tied down to dates common to the whole people. The First Code says nothing at all about it. The oldest mention of the 'year of remission' (*shemittah*) is found in Deuteronomy[1]: 'At the end of seven years thou shalt make the remission: and this is the manner of the remission. Every creditor shall remit that which he hath given on loan to his neighbour and to his brother, because the remission of Yahwe has been proclaimed. . . . Beware that there be not a wicked thought in thy heart, saying to thee, The seventh year, the year of remission, is at hand; and that it make thee not to turn the eye of evil towards thy brother, and thou give him nought,' &c. Here there is clearly indicated a fixed and common period for the creditors and debtors of the whole nation. This view is further confirmed by another ordinance also contained in Deuteronomy[2], where it is prescribed that in the year of remission the reading of the Law is to take place before the whole people. The observance of the year of remission and of its septennial cycle, would accordingly go back to the date of Josiah king of Judah, under whom (and, to be precise, in the eighteenth year of his reign, 621 B.C.), according to an old and very probable opinion, the prophetic code of legislation contained in Deuteronomy was proclaimed. In the epoch of Nehemiah the seventh year of remission was in full operation[3]; no traces of it are found later, and it seems that it was abolished soon after his date.

109. Repose of the Land: Sabbatic Year. The institution of a septennial repose of the land (also called the 'Sabbath

[1] Deut. xv. 1–9. [2] Deut. xxxi. 10. [3] Neh. x. 31.

of the land,' or the 'Sabbatic Year') seems to date back to the first beginnings of the Mosaic law. It appears to have been originally instituted either to secure the rest for the soil which was necessary in an epoch when agriculture had not advanced far, or for philanthropic objects. The First Code says[1]: 'Six years thou shalt sow thy land, and shalt gather the fruits thereof; but in the seventh year thou shalt leave it and abandon it, that the poor of thy people may eat thereof. . . . The same shalt thou do with thy vineyard, and with thy oliveyard.' It is, of course, to be understood that this repose of the land was not to take place simultaneously over all properties, and not even over all parts of the same piece of property: otherwise bad provision would have been made for the philanthropic object of the institution, and the danger would have arisen of starving the whole country once every seven years. This law of the rest for the land, after being vigorously enforced for some time, was afterwards irregularly observed and finally abandoned altogether: Deuteronomy makes no mention of it, nor does any prophet before the exile, and it seems to have fallen into oblivion even in the time of Ezra and Nehemiah[2].

[1] Exod. xxiii. 10, 11. Some critics, among them Hupfeld, Reuss, and Wellhausen, have concluded from the expression 'leave it (the fruit) and abandon it,' that to abandon the fruit of the seventh year does not necessarily involve that the land must be left uncultivated and the vine unpruned. The earth would according to this view be cultivated in the seventh year too and its fruit abandoned to the poor. This might stand, did not the preceding verse say quite clearly: 'Six years thou shalt sow thy land,' thus seeming to exclude sowing in the seventh year. The words 'repose of the land' seem to decide the question.

[2] Nehemiah (x. 31), enumerating the duties to which the people solemnly binds itself in relation to its God, says: 'We will forgo the seventh year and the exaction of every debt'; but is completely silent about the repose of the land. It has been wrongly believed that this repose is included in the expression 'forgo the seventh year': but these words refer to the remission of debts, and

110. At a time which cannot well be accurately fixed, but was in any case later than that of Nehemiah and earlier than the final redaction of the Pentateuch and its consecration as the Divine Law, there was inserted in the Pentateuch a collection of provisions relating to this subject which are completely different from those sanctioned shortly before by Ezra and sworn to by the people about 445 B.C. These new rules are contained in Leviticus xxv, with some additions in xxvii. Their effect is that the liberation of the Israelite slaves and the remission of debts are to be settled no longer in every seventh year but in every fiftieth year instead, that is, in the Year of the Jubilee, in which there was also to take place the simultaneous return of all properties acquired during the preceding fifty years to their former owners. These provisions remained a dead letter, as we shall see, and were never carried into practice. On the other hand the old and almost forgotten law of the septennial repose of the land was revived with great effect and much severity[1], almost in the same terms as those used in the First Code, but with the important difference that the year of rest was the same for

regulate the periodical return of this action. That the Sabbath of the Land had long fallen into disuse at the time of Jeremiah can be gathered from a passage of that prophet which is not found in his book but is preserved in Chronicles, where, in reference to the destruction of Jerusalem, it is said (2 Chron. xxxvi. 21) that it happened 'that the word of Jeremiah might be fulfilled, until the land had been compensated for its years of rest; through all the time of its abandonment it rested, to complete the seventy years.' Jeremiah, therefore, reproved the Jews for having neglected the Sabbath of the Land, which the First Code had ordained, and considered this to be one of the offences which called down the Divine wrath upon Israel. The passage of Jeremiah is repeated in almost identical terms in the twenty-sixth chapter of Leviticus (vv. 34, 35, 43), which seems to be partly taken from works by that prophet which we no longer possess. It is instructive to compare Lev. xxvi. 4, 12, 17, 29, 33, 37 with Jer. v. 24, xxx. 22, xxi. 10, xix. 9, ix. 16, xlvi. 12.

[1] Lev. xxv. 2–7, 20–22.

the whole land of Israel. This ordinance, which might appear to some absurd and tyrannical, was evidently introduced in order to render it easier to provide for its observance. The poor accordingly, to whom were reserved the spontaneous fruits of the earth in the year of rest, could satisfy themselves abundantly every seventh year, on condition, however, of fasting throughout the six intervening years. The nation was moreover subjected every seven years to the danger of a general and terrible famine.

111. In the time before the exile, when the two kingdoms of Israel and Judah contained millions of inhabitants living exclusively by agriculture, such a law would not have been possible. In the small Jewish community established after the exile in Jerusalem and in the villages round about, surrounded by strangers who came every day to sell provisions[1], the enactment, though a sufficiently heavy burden, was not so hard to carry out. It is a fact that it was imposed; and when the *Torah* (that is to say, the final and most comprehensive code of Mosaism as we now have it) was constituted in a definite manner, there appeared in it the order for the septennial repose of the land, to be observed universally in the seventh year, which was therefore called a 'Sabbatic Year.' It came into force and was faithfully observed down to the destruction of Jerusalem by the Romans in 70 A.D. The Sabbatic Year did not correspond to the sacerdotal year, which began in spring, but to the civil year of the Syrians, which had now come into use among the Jews, and whose beginning coincided with the new moon of the seventh month, generally falling in October. In this autumn the sowing was omitted, and in the following spring and summer gathering in was omitted. Under ordinary circumstances it was possible to make the necessary arrangements for obviating the danger of famine; but in case of war, and especially of siege, the

[1] Neh. x. 31, xiii. 16.

consequences of the Sabbatic Year made themselves felt on more than one occasion. We have evidence of it in the first Book of the Maccabees, where it is related that, when Antiochus Eupator had occupied Bethsura, the inhabitants had to leave the town as they had no more to eat, 'because it was the Sabbath of the land,' and shortly afterwards that famine was felt in Jerusalem 'because it was the seventh year,' and those of the Gentiles who had come into Judaea had consumed all the rest of the provisions in store[1]. Josephus narrates in the same way that during the siege laid by Herod to Jerusalem, the famine was aggravated by reason of the Sabbatic Year then running its course[2].

112. The notices as to various returns of the Sabbatic Year, which are found in the first Book of the Maccabees, in the works of Josephus, and in the Jewish traditions of the first centuries of our era, allow us to fix with some certainty the date of some Sabbatic Years[3]. Thus, from a study of the chronology employed in the first Book of the Maccabees, the result has been reached that the Sabbatic Year corresponding to the occupation of Bethsura by Antiochus Eupator (to which we have alluded above) lasted from the autumn of 164 B.C. to the autumn of the following year 163 B.C. The indications of Josephus as to the siege of Jerusalem effected by Herod with the aid of the Romans under Sosius[4], place the capture of the city in the consulship of M. Agrippa and Caninius Gallus; hence it can be inferred that the Sabbatic Year then in progress began with the autumn of 38 B.C. and

[1] 1 Macc. vi. 49, 53. [2] Josephus, *Ant.* xiv. 16.

[3] The remarks which follow are mainly dependent upon the discussions and results published by Schürer in the fourth edition of his most learned work, *Geschichte des jüdischen Volkes im Zeitalter Jesu Christi*, vol. i. pp. 32–8 [cp. Eng. tr. of earlier edition, I. i. 41].

[4] Josephus, *Ant.* xiv. 16.

ended with the autumn of 37 B.C. A third fixed point is furnished by a Jewish tradition according to which the year in which the Temple of Jerusalem was destroyed by the Romans had been preceded by a Sabbatic Year: that Sabbatic Year accordingly lasted from the autumn of 68 A.D. to the autumn of 69 A.D.[1]

113. Comparing these dates together, we find that the interval between the first and second of the Sabbatic Years indicated is one of 126 years, or of eighteen times seven years; and that the interval between the second and third is one of 105 years, or of fifteen times seven years. We may conclude from this that during the whole time comprised between the revolt of the Maccabees and the destruction of Jerusalem (and probably also for a certain time before the Maccabees) the recurrence of the Sabbatic Year was rigorously and regularly observed from seventh year to seventh year, without any interruption. If therefore any one wishes to ascertain whether a given year was a Sabbatic Year, he will be able to do it easily by examining whether the interval between that year and one of the three years above mentioned gives a number divisible by seven. To put it generally, if n be any whole number, we can say that the beginning of the Sabbatic Years took place in the years $7n+3$ before Christ and in the years $7n+5$ after Christ, in autumn. For instance, if $n=0$, it will follow that in the autumn of the year 3 B.C. a Sabbatic Year began, and so also in the autumn of the year 5 A.D. And if n be given the value of all the whole numbers successively (*i.e.* suppose $n=1, 2, 3, 4, \ldots$), any one who wishes can form a table of all the years before and after Christ in the autumn of which a Sabbatic Year began.

The question may now be raised, whether the period of the Sabbatic Year can be considered as a continuation of the analogous period of remission which fell out of use

[1] Jerusalem was taken by Titus in the summer of the year 70 A.D.

when the Sabbatic Year was instituted after the time of Nehemiah? This is probable enough in itself; but positive arguments and historical proofs cannot be adduced in support of it. Neither in the Old Testament nor elsewhere can any date be found which allows the years of remission to be calculated in the way which we have been able to adopt for the Sabbatical Years.

114. The Jubilee. Those legislators of Leviticus who came after Ezra tried to substitute for the septennial period of the year of liberty and for that of the year of remission, both of which had been abolished, a period of fifty years which was named the Jubilee because its beginning was proclaimed in the autumn of the fiftieth year by uttering with trumpets and horns called *yobel*, which were appropriated for this purpose, a cheerful musical sound[1]. The arrangement of this cycle is defined as follows[2]: 'Thou shalt number seven Sabbaths of years, that is, seven times seven years, so that the space of the seven Sabbaths shall be forty-nine years; and then shalt thou cause the sound of the trumpet to come forth on the tenth day of the seventh month, on the day of atonement, throughout all the country. And ye shall hallow the fiftieth year in the land, and ye shall proclaim liberty for all its inhabitants. It shall be a Jubilee unto you, and each man shall return to his possession and each man to his family. A Jubilee shall the fiftieth year be unto you. Ye shall not sow, neither reap that which groweth of itself, and ye shall not gather the grapes on the undressed vines. . . . In selling or in buying (a field) ye shall not deceive one another; according to the number of years that have passed since the Jubilee shall

[1] As I am informed by a friend, *yobel* most probably meant a *ram* (Joshua vi. 4–5); then it was applied to a *ram's horn* used as a trumpet (Exod. xix. 13: cp. R.V. margin).

[2] Lev. xxv. 8–42.

the price increase or diminish; because that which is sold is the number of the crops (i.e. to the next Jubilee). Ye may not sell the land for ever, because mine is the land, and ye are guests and tenants (usufructuaries) with me. . . . And when thy brother has grown poor and is sold to thee, thou shalt not treat him like a slave; but as a workman, as a temporary member of the house, shall he remain with thee down to the Year of Jubilee; then shall he depart free, he and his children, and return to his own family and to the possession of his fathers. For they are my servants, whom I have freed from the land of Egypt: they shall not be sold as slaves.' As we see, the object of all these rules is to reduce to a longer period, and so render less severe and easier to observe, the septennial recurrences of the year of liberty, and of the repose of the land, as prescribed in the First Code and in Deuteronomy.

115. The year of liberty, which was originally intended to be the seventh from the beginning of the term of servitude, and from which the majority of slaves were once able to profit, is now fixed for all without distinction in the Year of Jubilee; and herewith the hope of regaining liberty without paying redemption money became for a great number of them completely illusory. The year of remission seems to have disappeared from the Code, and to have fallen out of use after Nehemiah. There is no mention of it in the Jubilee legislation of Lev. xxv and xxvii. As regards the Sabbath repose of the land, it was certainly in appearance[1] an advantage to landed proprietors to render the renovation of the soil rarer by imposing it every fifty years instead of the original seven,

[1] I say *in appearance*, because we are not well acquainted with the conditions of agricultural land in Palestine at that time, or with the system of cultivation employed. Experience has shown that, where abundant and good manure is not available, repose becomes necessary at intervals even shorter than seven years.

but the benefit which the poor derived from it was clearly diminished by the same amount. On the other hand, a great benefit for the whole nation and an effect of moral and social importance might have been produced by the return of the estates to their old owners in the Year of Jubilee; this would have had the result of preventing the impoverishment of families and the excessive accumulation of the real property of the country in the hands of one individual. By making God the universal owner of all estates and of all slaves, and reducing themselves to mere usufructuary occupants for a limited time, the Israelites would have found the means of preventing (up to a certain point) the excessive inequality of fortunes, and would thus have provided a solution of the great social problem which so much troubles modern thinkers at the present day. In the mind of the legislator the redemption of slaves was certainly strictly dependent on the conception of the return of properties every fifty years; the repose of the land was undoubtedly meant to render the passage from one cultivator to another easier. But the interpretation of these rules in detail and, still more, their prescribed coexistence with the Sabbatic Year, have created serious difficulties about which it would not be proper to be silent here.

116. In Leviticus the law of the Jubilee begins by saying: 'Thou shalt number seven Sabbaths of years, that is, seven times seven years, so that the space of the seven Sabbaths of years shall be forty-nine years.' Here the phrase 'Sabbath of years' does not mean (as it could be interpreted) any period of seven consecutive years, but that seventh year which completes the week of seven years and is destined for the repose of the land: in other words, the 'Sabbath of years' is the Sabbatic Year, just as the Sabbath of days is the Sabbath Day. Notice further that after counting seven Sabbaths of years we ought to arrive at a total of

forty-nine years, and this could not be unless the 49th year were itself a 'Sabbath of years.' After this Sabbath one year will still remain, the fiftieth year of the cycle, which will be the Jubilee Year: in other words, the first Jubilee cycle will exceed by one year the seven weeks of years. The result will be this: in consequence of the regular, never interrupted progression of the Sabbatic Years from seventh year to seventh year (see §§ 112, 113), the arrangement of these years in the second Jubilee cycle will no longer be that prescribed by Leviticus, and another arrangement different again will take place in the third Jubilee cycle, and so on in succeeding cycles. And only for the first cycle will it be true that, when the seventh Sabbatic year is finished, the total will amount to forty-nine years.

117. Now, it would be possible to escape this difficulty by assuming that by 'Sabbaths of years' (*shabbĕthoth shanim*) we ought to understand not Sabbatic Years but mere periods of seven years, within which the Sabbatic Year could occupy the first, or the last, or any place. In this case the years of the seven weeks of years would always be forty-nine, and the Jubilee period would always be completed in the following year, the fiftieth. Even if this interpretation be admitted (and there is much to be said against it), all difficulties would not be thereby removed. It is in fact clear that, if the first Jubilee cycle begins with the first year of the week of years, it will also end with the first year. Again, the second Jubilee cycle will begin with the second year of the week of years, and also end with the second year. By continuing the calculation we see that the third Jubilee cycle will begin with the third year of the week of years and also end with the third year, and so on. It thus results that the fiftieth year, that of the Jubilee, must fall successively in all the seven years which compose the

week of years. Sometimes, however, it will happen that the Jubilee Year is immediately preceded or immediately followed by the Sabbatic Year. And as the repose of the land is obligatory in both years equally, the final result will inevitably be that it will be necessary to allow the land to rest for two consecutive years. The consequences can easily be understood if we represent to our imagination what Italy would become if two harvests of the land were completely omitted, one after the other. They would have been much more serious still among the Israelites in Palestine, where the inhabitants lived almost entirely upon the fruits of the earth, industrial occupations being certainly very small in extent and commerce completely non-existent. Ewald[1] has sought for a solution of this difficulty in a way which appears to me to be entirely illusory, as he practically assumes that the last week of years in the Jubilee period is a week of eight years: in other words, that the Sabbatic Years throughout the period are the seventh, fourteenth, twenty-first, twenty-eighth, thirty-fifth, forty-second, and fiftieth. Another similar answer had been propounded by the great scholar Moses Maimonides, with whose view Ideler[2] also associates himself. Maimonides says: 'The forty-ninth year is a Sabbatic Year, the fiftieth year is a year of *yobel*; the fifty-first forms the beginning of a new week of years.' This interpretation places a repose of the land in the forty-ninth and in the fiftieth year of every period, thus aggravating the difficulty on which we laid stress above in regard to the practice of allowing the land to rest for two consecutive years. Both solutions are also contrary to the law of the Sabbatic Year, which supposes a regular and uniform interval of seven years, as the law of the Sabbath Day supposes a regular

[1] Ewald, *Antiquities*, p. 375. [2] Ideler, *op. cit.* i. pp. 503–4.

and uniform interval of seven days. Now it is quite certain that during the existence of the second Temple this regularity in the periods of the Sabbatic Year was consistently observed, as has been proved above by historical dates ranging from the epoch of the Maccabees down to the destruction of the second Temple by the Romans.

118. All these difficulties have their root in the fact that the number fifty of the Years of the Jubilee cycle is not exactly divisible by seven, the number of the years of the Sabbatic cycle. It would easily be made to disappear if one could interpret the text of the law in such a way as to extract forty-nine years from it instead of fifty. Then the Jubilee Year (that is to say, the forty-ninth year) would also be a Sabbatic Year, and a more solemn Sabbatic Year than the six others which had preceded it in the course of the cycle. This expedient seems already to have presented itself very readily to the minds of some doctors of the Jewish law. In fact the *Book of Jubilees*[1], which is held to have been composed not long before or after the Christian era, arranges the whole chronology of the facts contained in the Pentateuch according to Jubilees of forty-nine years, whence it derives its name. And yet nearly at the same time Philo and Josephus[2] were affirming that the Jubilee period was one of fifty years. The period of forty-nine years was also accepted by a certain Rabbi Jehudah, who was persuaded, according to the statement in the Talmud[3], that the last Year of one Jubilee period was

[1] See the translation of this book by Littmann, published in Kautzsch, *Die Apokryphen und Pseudepigraphen des Alten Testaments*, vol. ii (Tübingen, 1900). [English translation by R. H. Charles, London, 1902.]

[2] Quoted by Ideler, *op. cit.* i. p. 506.

[3] Ideler, *op. cit.* i. p. 503, cites for this the tractate in the Talmud called *Erubin*.

to be counted as the first of the next Jubilee period; so that the duration of the cycle remains one of fifty years only in appearance but in reality is reduced to forty-nine, the order of the Sabbatic Years continuing to be perfectly preserved. The doctors of the school of the Geonim, which was the first school after the redaction of the Talmud was definitely closed[1], agreed to this method of interpretation, and cited a certain tradition according to which, after the destruction of the first Temple by Nebuchadnezzar, the years were no longer counted by Jubilee periods but only by Sabbatic Years. They even constructed a system of chronology according to these years, in relation to which their solution is in complete harmony with the formulae established above on the basis of historical dates. Among modern chronologists, some of the most authoritative, such as Scaliger and Petavius, have been in favour of a duration of forty-nine years.

Yet there are objections to this opinion also, as it does not accord well with the text of the law: that text indicates too clearly the period of fifty years. That in the mind of the legislator the duration was to be of fifty years and not of forty-nine, can also be proved from the fact that he has found it necessary (in Lev. xxv. 11, 12) to enjoin the repose of the land in the Jubilee Year. This would have been totally unnecessary had the period been one of forty-nine years, since the legislator could not have been ignorant that in this case the Jubilee Year coincided with a Sabbatic Year, so that there would be no occasion to make a special order for the repose of the land.

119. Whichever of the two hypotheses (of fifty or forty-nine years) one may incline to prefer, it is impossible to arrive at a satisfactory interpretation. The reason lies in the fact that in the twenty-fifth chapter of Leviticus two

[1] Ideler, *ibid.*

systems of rules have been combined together, which are not only different but actually irreconcilable with each other—the septennial system of the Sabbatic Year, and the Jubilee system of fifty years. These two systems cannot be considered as forming part of one and the same legislation; they have a different origin, and were probably conceived by different persons at different times. Their incompatibility gives us the right to predict that if the one system was put into practice at a given epoch, the other could not have made way at the same time and must have remained in the condition of a mere project. This is what really happened. Good historical evidence makes it quite certain that the Sabbatic Year was introduced into the rites of Judaism some time after Ezra and Nehemiah, and continued to be observed with the utmost regularity down to the destruction of the second Temple; while as to the actual observance of the Jubilee we find the most complete silence throughout, in the writers of all epochs.

120. The idea of the Jubilee, which is to be celebrated after seven weeks of years, is manifestly derived by analogy from that of the solemnity in spring, which (as we have said above) was celebrated when the harvest was finished, after seven weeks of days had elapsed from the offering of the *'omer*, and actually on the fiftieth day[1]—a solemnity of ancient institution which is already mentioned in the First Code and again sanctioned by the law of Deuteronomy. But neither in the First Code nor in Deuteronomy is any allusion to be found to the Jubilee; that is only alluded to in the twenty-fifth and twenty-seventh chapters of Leviticus and in one passage in Numbers[2]. The prophets were com-

[1] See above: ch. viii. § 96.

[2] In Lev. xxv and xxvii the law of the Jubilee is propounded, and its rules and exceptions are explained, in remarkably full detail. We have no other mention of the Jubilee in the Old Testament except in

pletely ignorant of it; otherwise they would not have had occasion to inveigh, as they do, against the accumulators of large estates. Isaiah says (v. 8): 'Woe to those that join house to house and add field to field, until all the space is occupied and ye dwell alone as inhabitants of the land.' Similarly Micah (ii. 2): 'Woe to those that desire fields and seize them by violence, and desire houses and take them away; they oppress a man and his house, even a man and his heritage.' But even during the period of the existence of the second Temple there is no evidence attesting a single celebration of the Jubilee; and yet so memorable and so extraordinary an event must have left some record of its occurrence. It is true that some writers of that epoch allude to the Jubilee, and we have already mentioned Josephus, Philo, and the *Book of Jubilees*. But these evidently derive all their knowledge of it from Leviticus; sufficient proof may be found in their not agreeing as to the length of the period, the first two authors putting it at fifty years, the third at forty-nine. Josephus also (*Ant.* iii. 12), when speaking of the Jubilee, shows himself to be ill-informed, and attributes to Moses ordinances completely different from those which we read in Leviticus. All this would be impossible if the Jubilee had been a fact of experience for them, publicly known and observed.

In what way, however, two such contradictory laws have been combined together in the Priestly Code, and how they came to find themselves associated and even amalgamated together in one and the same chapter[1], it is no longer

Num. xxxvi. 4, on the subject of the daughters of Zelophehad: allusion is there made to the return of estates to their owners. In Exod. xix. 13 and Joshua vi. 4–6 the reference is only to the instrument called *yobel* [see p. 146, note 1]: not to the period of the Jubilee, as some have thought.

[1] In Lev. xxv, verses 1–7 deal with the Sabbatic Year, 8–19 with the Jubilee; 20–22 again refer to the Sabbatic Year, and from 23 onwards it

possible to know exactly. But certain facts ought not to be omitted which are connected with this question.

121. The Priestly Code as it exists for us in the Pentateuch, although having its roots in the First Code, in Deuteronomy, and in the ritual of Solomon's Temple, is principally, as is well known, the result of manifold and complicated legislative labour which took place during and after the exile, over a total period amounting perhaps to two centuries. The great problem of reconstituting the nation by adapting its ancient uses to new circumstances was undoubtedly an object pursued with much zeal, and it gave occasion for various proposed laws, some of which secured, others did not secure, others again only secured for a certain time, the favour of the public. We may cite in evidence of this the experiment (a somewhat fantastic one, to speak candidly) of a similarly suggested system of laws relating chiefly to the Temple, to its *personnel*, and to rites, which are preserved to our own times in the last nine chapters of the Book of Ezekiel; not a few traces of this system succeeded in making their way, long afterwards, into the Priestly Code. Another example of this process of formation may be found in the seventh chapter of Zechariah, where we see clearly that certain questions of ritual remained unsettled in his time, and that certain practices were then in use of which no sign is any longer to be found in the later laws. To all these uncertainties the legislation of Ezra to a certain extent put an end, when it was solemnly proclaimed and sworn to by the people in 445 B. C. or a little later; not so much so, however, but that new additions and modifications of great importance were supplementarily made, down to the time (about 400 B. C.?) when the *Torah* was finally consecrated as a sacred and invariable Canon under the

is again the Jubilee. Here is shown the negligence of a compiler who welds together heterogeneous or even contradictory materials.

form of the existing Code of the Pentateuch. It is accordingly no matter for surprise that the result should have been a collection, which was not always well arranged, of laws belonging to different epochs, sometimes even contradictory one of another.

122. Returning now to the two laws contained in the 25th chapter of Leviticus, we may observe that one of them, relating to the Sabbatic Year, though sanctioned at so late a date (§§ 110 and 111), seems to have been proposed as early as during the exile. It is declared, namely, very shortly afterwards in the context (xxvi. 33–5), that in the time of the exile 'the land shall enjoy its Sabbaths all the time that it shall remain desolate and that ye are in the country of your enemies. . . . It shall rest all the time that it shall stand desert, because it rested not in your Sabbaths while ye dwelt in it.' Only a prophet of the exile could speak in these terms; and that prophet, if we accept the evidence of a passage in Chronicles, would be no other than Jeremiah[1].

The law of the Jubilee, reducing the liberation of slaves and the repose of the land, to every fiftieth year, produced a considerable alleviation of burdens. It is accordingly not probable that it was conceived in the fervour of ideas, and in the spirit of zeal, suitable to the period of the exile, a time of hope and of expectation, in which no duty seemed too severe for the people to bind themselves to undertake in the restored Jerusalem. A law so practical and so well adapted to the straitened circumstances in which the Israelite community lived for a long time after Zerubbabel, was certainly proposed after the return from exile.

Neither of the laws seems to have been contained in the code of Ezra. In the oath imposed upon the people during the solemn convocation[2], mention is made only

[1] 2 Chron. xxxvi. 21. See above, p. 141, note 2. [2] Neh. x. 31.

of the septennial remission of debts. We may conclude, therefore, that neither law had been observed before, but only expounded in books of older date, and that both were introduced into the Priestly Code by its last compiler at a time subsequent to Ezra. He seems to have had the intention of combining in it, as in a *corpus juris*, many laws, ancient and modern, which came to his notice; at any rate those which did not conflict too manifestly with the principal rules of Mosaism, even though they might be in none too great harmony with them[1].

123. In connexion with the Jubilee we may notice in addition, on the ground of curiosity, that if the Jews had fixed it at forty-nine years, not only would it have been possible to arrange the Sabbatic Years in it conveniently, but they would also have gained the advantage of being able to use it for the regulation of the intercalary months, and for determining the beginning of the year. The period of forty-

[1] The ten chapters of Leviticus, xvii–xxvi (and thus, also, the laws of the Sabbatic Year and of the Jubilee, along with them), together constitute a unity which offers distinct characteristics from the rest of the Priestly Code. Accordingly, various critics (Graf, Hupfeld, Reuss, Wellhausen) would wish to recognize in them what is practically a separate code, earlier than the Priestly Code, and amalgamated at a later date with the other elements of the latter. If it be admitted that the two laws of the Sabbatic Year and of the Jubilee were originally included in this separate collection, the eclectic combination of these contradictory elements would be due to its author and not to the final editor of the Priestly Code. But Wellhausen's examination of Lev. xxv (*Composition des Hexateuchs*, ed. 3, pp. 164–7) does not appear to have led to decisive results. Wellhausen seems to favour the idea that the collection in Lev. xvii–xxvi originally contained only the law of the Sabbatic Year, and that the law of the Jubilee was introduced into it later. The final results would not be materially different from those expounded above in the text. All that is said about the law of the Jubilee in Lev. xxvii, and the allusion to it in Num. xxxvi. 4, seem to be additions made by the last editor of the Priestly Code.

nine years constitutes, in fact, an astronomical lunisolar cycle, not so very much inferior in accuracy to the famous Metonic cycle of nineteen years, and greatly superior to the *octaeteris*. It is found by calculation that 606 lunations are nearly equal to forty-nine solar years, the lunations falling short only by thirty-two hours[1]. This is equivalent to saying that if the calendar be regulated, as it was among the Jews, chiefly by observation of the moon, the supposition that after 606 lunations forty-nine years exactly have passed, would produce an error of only thirty-two hours in regard to the position of the sun and the course of the seasons—an error which could only become appreciable in agricultural practice at the end of eight or ten periods. Thus the foundations of a simple and practical calendar are spontaneously offered, without reckoning the utility which would be derived from a cycle of such length as one of forty-nine years, for the computation of time and for establishing the dates of events. But it may be regarded as certain that the Israelites never had any notion of such a way of regulating their Passover. So far as chronology is concerned, it cannot be doubted that the habit of reckoning times by weeks of years[2], or by weeks of weeks of years[3], had its root, not in astronomical phenomena, but simply in the superstitious veneration with which the Jews (and not they only) have always regarded the number seven.

[1] Supposing the solar year to consist of 365·2422 days, and a lunation of 29·5306 days, we have this result:

49 years =	17896·86 days
606 lunations =	17895·54 days
Difference =	1·32 days

Notice that in forty-nine years the error of the Julian Calendar amounts to 0·40 day.

[2] Dan. ix. 24–7.

[3] As in the *Book of Jubilees*, where all the chronology of the Pentateuch is arranged according to periods of forty-nine years.

It was out of respect for the number seven and for its square forty-nine that, as late as the thirteenth century, the Jewish authors of the Alphonsine Tables assigned 49,000 years as the period for a complete revolution of the equinoctial points; while Hipparchus and Ptolemy had already calculated it better at 36,000 years, and we know now that it is really somewhat less than 26,000.

APPENDIX I

THE CONSTELLATION 'IYUTHA' IN THE SYRIAC WRITERS

In his *Thesaurus Syriacus* (p. 2866), Payne Smith has referred to the authorities which may be considered to prove that *'Iyutha* is the name given by the Syrians to the head of the celestial Bull, formed by the large star Aldebaran and the smaller Hyades round it. The most important of these authorities is Barhebraeus or Gregory Abulfaraj (thirteenth century), who asserts, in his astronomical work *De ascensione mentis*, that *'Iyutha* is a star of the first magnitude in the Bull, adding that, together with four other smaller stars, it forms the shape of the Greek letter A. That what he says is true can be seen from the illustration of the Hyades given on p. 57.

Another piece of evidence, which has the advantage of being much older still, is contained in the passage cited from the Talmud in a note on p. 58, where we are told that, in a disputation held in the presence of the great teacher Rabbi Jehuda (about 160 A.D.), some of the disputants said that *'Iyutha* was the head of the Bull, while others identified it with the tail of the Ram. Probably the two sides meant the same thing under different names[1].

[1] We can give a plausible explanation of the manner in which the tail of the Ram (represented in the sky by some small stars of the fourth or fifth magnitude) comes to be introduced, by noticing that the word *rosh*, used here by the doctors of the Talmud in the sense *caput* (Tauri), may also be understood in the sense *initium*. It is not impossible that some of them took it as *initium Tauri* (beginning of the Bull) instead of *caput Tauri* (head of the Bull). Now, since in the Zodiac the Bull comes next after the Ram, the place where the Bull begins is the same as that where the Ram finishes, and is exactly the spot where the tail of the Ram is to be found. On this supposition, accordingly, we can understand how the tail of the Ram was identified, not with the *beginning* of the Bull, an error which would not have been serious, but

It does not seem possible to doubt that *'Iyutha* should be understood to be the Hyades. There are, however, some indications in Arabic and Syriac writers from which it has been believed that another meaning can be drawn. It will be well to transcribe them here, as they are found quoted by Gesenius in his *Thesaurus*, p. 895 B.

Bar Ali: *'Iyutha* est *el-'aiyūq*, una stellarum Tauri; secundum alios Orion. Bar Bahlul: *'Iyutha* in libro Honaini *el-'aiyūq*, quae stella Tauri est et Ghimel litterae figuram refert, et post Pleiades currit: aliis Aldebaran. Lex. Adl.: *'Iyutha* est *'aiyūq*, una stellarum: Orion vel Pleiades. Firuzabadi: *el-'aiyūq* est stella rutilans parva et lucida in dextro latere Viae Lacteae, quae sequitur Pleiades, nunquam praecedit. To these testimonies an Arabic version of the Peshiṭta is to be added, where *'Iyutha* is regularly translated by *el-'aiyūq*.

If we put these authorities together, and neglect the references to Orion and the Pleiades, which certainly ought to be excluded from consideration, we should arrive at the result that *'Iyutha* ought to be considered to be identical with *el-'aiyūq* of the Arabs. Now it is perfectly true that, in the uranography of the Arabs, *el-'aiyūq* is the name of the star which the Greeks call *αἴξ*, and we, following the Latin usage, call *Capella*[1]; but it is equally true that the writers cited above meant by *el-'aiyūq* another star, which is in fact Aldebaran, or Aldebaran with the other Hyades. This will become clear when the words of the authors in question have been carefully examined.

They say that *'Iyutha* is a star of the Bull, which is true of Aldebaran, but not of Capella: that it is a red star, which cannot be said of Capella, but is eminently true of Aldebaran: that it is on the right of the Milky Way, and Aldebaran is on the right while Capella is on the left: that it follows the Pleiades in their daily course, and it is a special characteristic of Aldebaran to follow the Pleiades very closely, a circum-

with the *head* of the Bull, which is quite wrong. The head of the Bull and the tail of the Ram occupy different positions in the sky, and the distance between them is about 20 degrees.

[1] Ideler, *Sternnamen*, p. 92. From *el-'aiyūq* has arisen by corruption the name *Alhayoth*, sometimes used on our maps of the sky to designate *Capella*.

stance from which it is precisely Aldebaran too that is called by the Arabs *Tāli al-nejm* ('that which follows the Pleiades') or *Ḥādi al-nejm* ('that which pushes the Pleiades before it'): finally, that *'Iyutha* imitates the shape and position of the letter Gimel, which exactly fits the Hyades, as they represent in their arrangement the shape of the letter *g* in the Cufic alphabet and in the Estrangelo Syriac alphabet, namely ܓ. To this arrangement one of the writers cited (Bar Bahlul) evidently refers, as can be seen by observing the figure of the Hyades on p. 57. Rightly interpreted, these writers agree with the rest in bearing witness to the identity of *'Iyutha* with Aldebaran and with the smaller Hyades; and it is no longer possible to raise any doubt about this identity.

The Syriac version identifies *'Ash* and *'Ayish* with *'Iyutha* in two passages of Job (ix. 9 and xxxviii. 32), but it uses *'Iyutha* in Amos v. 8 to represent the Hebrew name *Kesīl*, which in other places it rightly renders by *Gabbarā* (i.e. Orion: see § 44). It would not, however, be lawful to infer from this that *'Iyutha* and *Gabbarā* are the same, since the same version in Job ix. 9 places these two names in succession one after the other, as though they were two different constellations. Accordingly, *'Iyutha* in the Peshiṭta of Amos v. 8 must be regarded as an error. Still more singular is the use of this word in Job xv. 27, where there is certainly no allusion to constellations.

APPENDIX II

KĪMAH, 'AYISH, MAZZAROTH

The present volume had already been entrusted to the printers when, through the kindness of Professor Driver, I was enabled to read an article by Professor Stern of Göttingen on the constellations named in the Book of Job[1]. That article has led me to add some notes and reflections to the account which I have already given of this subject in chapters iv and v.

[1] M. A. Stern, *die Sternbilder in Hiob* xxxviii. 31–2 (Geiger's *Jüdische Zeitschrift*, vol. iii [1864–5], pp. 258–76).

Our attention is claimed in the first place by a passage in the Talmud to which Stern refers (*Rosh hashshanah*, p. 11), bearing on the meaning of the words *Kīmah* and *'Ayish*. Rabbi Joshua, in speaking of the Flood, says that the rain began on the seventeenth day of the month Iyar, on which *Kīmah* is accustomed to rise in the morning, and the springs begin to dry up. In consequence of the perverse behaviour of men, God also changed the order of the universe: in place of its morning rising, He caused *Kīmah* to set in the morning, and removed two stars from it: the springs swelled, and the Flood took place. According to Rabbi Eliezer, these changes took place on the seventeenth day of the month Marḥeshvan, when *Kīmah* is accustomed to set in the morning, and the springs increase. God reversed the order of the universe: *Kīmah* rose on the morning of that day, and lost two stars. The springs continued to increase, and the Flood took place [1]. By interpreting these dates (the seventeenth Iyar and the seventeenth Marḥeshvan) according to the Julian calendar, Stern shows that they correspond exactly to the morning rising and setting of the Pleiades. There cannot therefore be any doubt that, among the Jews of the time of Rabbi Joshua and Rabbi Eliezer (at the beginning of the second century A.D.), the Pleiades were called *Kīmah*; and this is the oldest evidence for this title next to that of the Septuagint [2].

[1] Stern, *l.c.*, p. 273, where reasons are given for two corrections which are necessary in order to render this story in the Talmud intelligible and coherent. These corrections have been introduced in the text above.

[2] I think it useful to add another consideration about *Kīmah*. In the Peshiṭta the names of the other Biblical constellations are all altered and reduced to their Syriac equivalent: the name *Kīmah* alone is kept unchanged (under the form *Kīmā*) in all three places where it occurs. This fact admits only of two explanations. *Either* we must suppose that the authors of the version did not know the Syriac equivalent of *Kīmah*, and have therefore abstained from translating it, just as the LXX had already done in the case of *Mazzaroth*; *or* we must admit that this constellation had the same name in Hebrew and in Syriac. This second hypothesis seems the more probable. As a matter of fact *Kīmā* is used throughout Syriac literature to represent the Pleiades, as can be seen from the numerous quotations collected by Payne Smith (*Thes. Syr.* p. 1723). This would certainly not have occurred if the Syrians had originally called the Pleiades by another name. The Romans, who originally called them Vergiliae, never abandoned the use of this name, except that, on rare occasions and especially in the poets, they imitated the Greeks, and also used the term Pleiades.

In the same passage in the Talmud, the account of Rabbi Joshua and Rabbi Eliezer is completed by saying that God, after having taken two stars from *Kīmah* and produced the Flood, caused it to cease by taking away two stars from *'Ayish*. In other words, after having diminished the drying force of *Kīmah* by taking away two of its stars and thus producing the Flood, God caused the Flood to cease by taking away two stars from *'Ayish* and thus diminishing its rain-producing force. Stern maintains it to be indubitable that by this constellation *'Ayish*, the bringer of rain, the Talmudists meant to indicate the Hyades[1]; and this appears no less certain to us, after the discussion of *'Ayish* in chapter iv. We have, however, in this passage cited from the Talmud, a new witness in favour of the identity of *'Ayish* and the Hyades. Further, if we combine this passage with another cited in the note on p. 57, on the identity of *'Ash* and the Hyades, we conclude that the identity of *'Ash* and *'Ayish* was regarded as certain even by the most ancient Talmudists.

Professor Stern does not, however, allow himself to be influenced by these testimonies of the ancient Rabbis: he has formed for himself a system of the constellations in Job, from which he deduces very different results. He lays down as his starting-point, that, in the passage to which he pays special attention (Job xxxviii. 31–2), the choice of the four constellations and the order of their names are not adopted by chance or without a rule. He has endeavoured to find this rule, and in his interpretation he follows it with unbending rigour. He remarks in the first place, following Otfried Müller, that four only out of the remarkable groups of stars placed in the middle and southern regions of the sky have given rise to important legends in the primitive mythology of the Greeks: these four are the Dog (Sirius), Orion, the Hyades, and the Pleiades. They are contiguous and form a continuous belt in the sky, in which they follow according to the order here given. Finally, it is noteworthy that all these constellations, together with their dates of rising and setting in relation to the sun, stood as signs, in the old Greek rustic and meteorological calendar, for seasons in the year which are important for certain agricultural labours, for the

[1] Stern, *l. c.*, p. 274.

return of rain, of the unhealthy season, and of noxious states of the atmosphere. Now, in Job xxxviii. 31–2, there are just four constellations mentioned, and these are certainly important ones, as their names occur elsewhere also in the Bible: *Kīmah, Kesīl, Mazzaroth,* and *'Ayish.* The enumeration of them is preceded by a series of meteorological indications (verses 22–30), and followed by a similar series (verses 34–8). To the influence of the heaven (that is, of the stars) over the earth, a direct allusion is made immediately after the passage in question (verse 33). From all this Stern concludes that the author of the Book of Job selected these four constellations, not so much because of their brightness, as because of their connexion with atmospheric phenomena and because they afforded indications of some important phases of the seasons. For the rest, he tacitly assumes as certain that these connexions and indications at the time of the writer were the same as in Palestine, paying no attention to difference of latitude and climate. He seems also to be persuaded that Jews and Greeks must necessarily have judged in the same way of these connexions and indications, and that their astro-meteorological science was composed of the same elements combined in an identical manner. As, therefore, the number of the constellations is four in both the subjects of comparison, and as the order of names in Job is held to be necessarily the same as that of the constellations in the sky, it will be enough to assign to one of the names the corresponding constellation, and all the rest is fixed. Stern assumes with the majority of interpreters (as we have also assumed in this book) that *Kesīl* represents Orion. This being granted, it is only necessary to write down the two series in parallel columns, so as to bring *Kesīl* and Orion opposite each other; and this happens if we begin the one series with *Kīmah,* the other with Sirius, producing the result

Kīmah = Sirius,
Kesīl = Orion,
Mazzaroth = Hyades,
'Ayish = Pleiades.

Thus the system is complete in all its parts and all its consequences. Stern proceeds to develop with great ability his arguments in favour of each of the identifications which he proposes.

In regard to the identification of *Kīmah* with Sirius, he cannot in reality find anything to say beyond the consideration that, from the brilliant constellations named in Job, the most brilliant star in the sky cannot be absent. For the rest, he adds that the Jews might, like the Greeks, have recognized in this constellation a dog—or even a mad and hence a chained dog. So he succeeds also in giving on his hypothesis a plausible interpretation of the disputed word *ma'anaddoth*.

The identification of ''*Ayish* and her children' with the Pleiades has in its favour the popular simile for the Pleiades of a hen and her chickens, which is widely diffused in the west and seems to have been known in the east too. The passage in the Targum which Stern cites on this subject[1] is worthy of note. Yet it cannot be denied that the expression ''*Ayish* and her children' is equally well adapted to Aldebaran and the minor Hyades surrounding it. As for the etymology suggested by Kimchi, deriving '*Ash* from '*ush*, 'to gather together,' this agrees excellently with a group of stars like the Pleiades; but we may observe that the Hyades are no less striking as a group, and that the name *Kīmah*, to which the LXX, the Syriac writers, and the Talmudists bear witness as an equivalent for the Pleiades, offers an equally appropriate derivation from *kūm*, in Arabic 'to heap up.' Stern holds that the two names '*Ash* and '*Ayish* certainly refer to the same constellation, but with this difference, that '*Ash* represents the entire group of stars, and '*Ayish* is a derivative from it, to stand for the principal star of the group. In this way he explains the fact that '*Ash* is mentioned by itself, while '*Ayish* appears accompanied by her children. The idea is ingenious, and is as applicable to the Hyades as to the Pleiades.

For the Hyades, however, Stern has reserved the Biblical name *Mazzaroth* or *Mazzaloth*. He derives this second form from the root *nazal*, 'fluxit,' making *Mazzaroth* mean 'the stars which cause (the waters) to flow,' or, in other words, the stars that bring rain[2]. Now this was exactly the character of the Hyades in the opinion of the Greeks and Romans, amongst whom the evening setting of the Hyades was wont to announce, about the middle of April, the beginning of the

[1] Stern, *l. c.*, p. 262.

[2] [This root is only found in Joel iii. (iv.) 11, and is a very uncertain one.]

spring rains and the season of equinoctial storms. Stern tacitly assumes that, at the time when the Book of Job was written, the same coincidence existed between these two celestial and terrestrial phenomena. This I must deny. The period of spring rains during the second half and end of April, which gave to the Hyades such a bad reputation in Greece and Rome, also occurred in Palestine, but commenced a month and a half earlier, at the end of February or the beginning of March, according to our present calendar, and was wont to announce its arrival with great regularity every year by a succession of cold, rainy days which were especially harmful to the health of the old, and on that account are called in Syria and Palestine *eiyām el-'agāiz*, 'the days (of death) of the old[1].' Immediately after these days spring begins, and throughout its course beneficent rains continue at intervals, which bring the crops to maturity[2]. But at no epoch of Jewish history was the commencement of the period to which we refer marked by special phenomena connected with the Hyades[3]. At the date when we may reasonably suppose the Book of Job to have been written, the Hyades and their evening setting announced in Palestine, not a rainy season, but the return of summer and the beginning of reaping-time in the fields.

But this is not the only difficulty. It is also necessary to explain how the Jews at the time of Ahaz and Manasseh, following the example of the Babylonians and Assyrians, came to honour with special reverence, along with the sun and moon, the Hyades also, in agreement with what is said in 2 Kings xxiii. 5. An evidence of this special reverence is found by Professor Stern in the astronomical representations

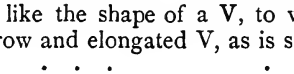
[1] Riehm, *Handwörterbuch d. bibl. Alterthums*, ed. 1, p. 1763.

[2] Riehm, *l. c.* These are the spring rains [A. V., R. V., 'latter rain'], to which the Jews gave the name *malkōsh*, to distinguish them from the autumnal rains called *mōreh* (Jer. v. 24; Deut. xi. 14); cp. p. 32 *n.*

[3] At the beginning of the Christian era, on latitude 32° (that of Jerusalem), the smaller Hyades disappeared in their evening setting about April 16. In 750 B.C. the same phenomenon took place about April 6: these dates are given according to the Gregorian style, which is sufficiently close to the course of the sun for such questions. Aldebaran, being a much more brilliant star, remained visible in the evening twilight for a little longer and made its evening setting about three days later. In this calculation I have supposed the *arcus visionis* to be 15° for the minor Hyades and 12° for Aldebaran.

contained on many of the cylindrical seals which the soil of Mesopotamia has preserved. On the upper part of the scene, sculptured on the convex surface of these cylinders, the sun and moon are seen figured, or sometimes also the moon alone; in other cases the sun and moon are accompanied by seven small disks which, according to all probability, represent seven stars. The geometrical figure which they form is not always the same. On some cylinders Stern has recognized the shape of the letter V which is characteristic of the Hyades, and he has found in this an evident sign of the importance which this group of stars must have had in the astral theology of the Babylonians. So then, along with the worship of the moon and the sun, there would have come from Babylonia to Jerusalem the worship of the Hyades, that is, of *Mazzaloth*. And in these cylindrical seals we should have a clear and simple illustration of the passage in 2 Kings, where sun, moon, and *Mazzaloth* are found associated together[1].

The works of Layard and Ménant, which form the principal sources for the study of these cylindrical seals, are not accessible to me. But I have been able to collect from other books a certain number of Assyrian and Babylonian astronomical representations, partly sculptured on cylinders, partly on larger and more important monuments, and sometimes of known date. I have found the seven stars on thirteen of these representations; but four out of this number I have had to exclude, either as being imperfect or as presenting some reason for doubt[2]. In two other cases I have seen something like the shape of a V, to which Stern alludes—a very narrow and elongated V, as is shown in (*a*) below[3].



(*a*) (*b*)

Six times I have found the seven stars arranged in two

[1] Stern, *l. c.*, pp. 268–9.

[2] One of these four is the pillar of Esarhaddon found at Zenjirli, of which we shall have to speak later. Two others are reproduced in Babelon (Lenormant, *Histoire ancienne de l'Orient*, ed. 9, iv. 195, v. 310); the fourth in *Trans. Soc. Bibl. Archaeol.* v. 642.

[3] Babelon in Lenormant, *op. cit.*, v. 299 and 347. They are two cylinders; in both, the seven stars are accompanied by the moon and the sun.

parallel lines, the upper line containing four, the lower three stars, as is shown in (*b*). This arrangement is not only found in two of the cylindrical seals which I have seen[1], where it might be thought that the exceedingly small scale had rendered an exact design difficult, but also on four larger monuments where the defect is not due to considerations of space. We see it on three magnificent bas-reliefs of Nimrod, which represent Asshurnazirpal in his chariot, ready for war or for a lion hunt[2]. It is also drawn with absolute geometrical precision on a curious bronze tablet of Assyrian origin, found at Palmyra (and now in the Leclercq collection at Paris), which contains a mythological representation of the universe[3]. My impression is, therefore, that (*b*) ought to be regarded as the normal or ritual arrangement of the seven stars, and that (*a*) is derived from it by mere imperfection of drawing, which is easily intelligible in such minute representations. In no case, as it seems to me, can we see here the shape of the Hyades, in which the branches of the V display a much larger deviation from each other and form between them an angle of about 60 degrees[4].

[1] Lenormant-Babelon, *op. cit.*, v. 248 and 296. On both cylinders the seven stars are accompanied by the astronomical triad, the moon, the sun, and Venus.

[2] Lenormant-Babelon, *op. cit.*, iv. 120, 155, and 376, where in all three cases the seven stars are accompanied by the figures of the moon and of Venus.

[3] Published in the Paris *Revue Archéologique*, 1879, p. 387, tab. 25; also in Lenormant-Babelon, *op. cit.*, pp. 292–3. It is also described by D. Bassi, *Mitologia Babilonese Assira*, pp. 160–2. The seven stars are here accompanied by the usual astronomical triad, but, contrary to the ordinary usage, Venus occupies the first place and the moon the last. The sun is represented according to the type used in Assyria. I ought to mention the exceptional case presented by a cylinder published in *Proc. Soc. Bibl. Archaeol.*, 1897, p. 301, where the stars are arranged almost like the Great Bear. Here too, however, is marked, though in a different way, the division into two groups of four and three stars respectively, which is rigorously observed in the cases of the normal type.

[4] The number of the Hyades also causes some difficulty. Stern supposes that the shape of the V as we understand it is composed of *five* stars (the number which the majority of the classical writers also admit for the Hyades); and, to obtain the number *seven*, he is obliged to prolong the two arms of the V to four times their true length, by including in the Hyades the two distant stars β and ζ Tauri, which form the points of the two horns of the Bull. But it is difficult to allow this, as those two stars are between 18 and 20 degrees distant from the

Jensen and Zimmern [1] see in the group of the seven stars a representation of the Pleiades. Long before, Layard [2] had believed himself to recognize a certain likeness in the manner of arrangement of the two. But the resemblance leaves something to be desired; for the Pleiades visible to the naked eye are only six, arranged in one rather irregular line of four stars and another, nearly parallel to the first, of two. Of the remaining telescopic stars the most brilliant, which might complete the number seven for an exceedingly acute eye, is quite outside the order formed by the six brighter stars which are visible to the naked eye. It is true enough that the Pleiades were of great use to the Babylonians, enabling them to determine, by observing them on the first days of each year, whether the year thus commenced ought to include twelve or thirteen lunations. But this does not seem sufficient to justify the constant association of the Pleiades with the great divinities of the sky, Sin, Šamaš, and Ištar.

Perhaps all the difficulties may be overcome by suggesting the hypothesis that the fundamental conception of these astronomical representations is very ancient, belonging to a time when for the Babylonians (as can be proved to have been the case for the Egyptians) the number of the minor planets was seven rather than five: a date at which the identity of Hesperus and Lucifer had not yet been determined, and the further identity (which is much harder to establish) of the morning and evening Mercury was not yet known, so that each of these planets counted as two. The discovery

rest of the group, all of which is included in a diameter of less than 5 degrees. The truth is that, to an eye that is only moderately sharp and attentive, the Hyades look like five stars only, one placed at the apex of the V, two at the ends of the branches, and two at the middle point of the branches. But a really sharp and attentive eye will not hesitate to recognize that each of these two last stars (called by astronomers δ and θ Tauri) is composed of two stars, which are very near together, the distance in δ being $18'$, and in θ only $5'$. This explains why some ancient writers counted seven Hyades instead of five; and, to obtain the number seven, it is not necessary to increase the constellation fourfold so as to reach the horn of the Bull. It is also true that the seven Hyades, when defined thus, no longer present the great likeness which Stern supposes with the Babylonian and Assyrian designs of the seven stars.

[1] Zimmern in *KAT.*[3] pp. 620–1. Jensen, *Kosmologie der Babylonier*, p. 92.

[2] Layard, *Nineveh and its remains*, ii. p. 447; Stern, *l. c.*, p. 268.

of the true number of the minor planets certainly dates among the Babylonians from before the twelfth century B.C., since (as has been already said in chapter v) the *kudurru* or boundary stones of that time already show Venus as one star, associated with the sun and the moon. When we consider the matter in this light, we succeed in understanding how, on monuments of extreme antiquity and earlier than the twelfth century, the association of the sun and the moon with *seven* planets is perfectly natural, and is in fact what we ought to expect in preference to any other arrangement. In this opinion we are confirmed by the division of the seven stars into two lines of four and three. The four stars of the upper line are evidently Venus and Mercury, each in its morning and evening elongation, and each therefore treated as two different stars. The three stars of the other line correspond to Mars, Jupiter, and Saturn, whose phenomena are, as is well known, widely different from those of the two apparitions of Venus and of Mercury. It will not seem difficult to admit that these representations then went on being repeated (sometimes perhaps without their real meaning being understood) and consecrated as religious symbols even in much later times, when it is considered that in these material things religions frequently preserve tenaciously the forms of the past, even when those forms have lost, as a whole or in part, their primitive significance. So *seven* planets continued to figure along with the sun and the moon, even when the true number *five* was known. And when the worship of Ištar had attained great pre-eminence (especially in Assyria) and the triad of the three great celestial divinities, Sin, Šamaš, and Ištar, was formed, the seven planets continued to figure together with it, although Venus was already represented by two of the minor stars.

As to the nature of the symbols of astronomical theology set forth by the idolatrous kings of Judah for the veneration of the Jews, we can form a conjecture by studying the very complete astronomical representation which is cut on the bas-relief placed at Zenjirli in Northern Syria in honour of Esarhaddon king of Assyria, while Manasseh was reigning in Jerusalem[1]. The field surrounding the king's head is com-

[1] I have not seen this stone; but I have under my eyes two excellent photographic reproductions, both published by Bezold, one in his

pletely filled by sculptures of the most elaborate detail, and contains in its central part four divinities, each supported by an animal symbol. On the right of these stand, in the usual order, the figures of the great astronomical triad, the moon, the sun, and Venus, that of the sun designed according to the type used in Assyria. On the other side are four small disks, represented in the same way as the seven stars of the cylindrical seals and of other monuments. The irregular arrangement of these four disks and a bare space by their side (which could hardly be seen on a representation so crowded that all the figures are almost touching each other), afford some ground for the suspicion that the disks here too were originally seven in number and that three of them were suppressed, perhaps by the sculptor of the monument himself[1]. Whether, however, the number of the disks was four from the first, or whether this number ought to be looked upon as the result of a later correction, in either case the reason is evident why it has been adopted in place of the canonical number seven. We see here an attempt to adapt the symbols venerated by antiquity to the notions of positive astronomy, for which it was already a well-established fact that, including the sun and the moon, the number of the heavenly bodies, the interpreters of destiny and the basis of all later astrology, was seven and no more. As the moon, the sun, and Venus are already represented on the monument as members of the great triad, four disks were enough to represent the remaining planets, Saturn, Jupiter, Mars, and Mercury. The number of four minor stars, instead of seven, may be considered as a proof that the small disks on all these monuments represent the minor planets and have nothing to do with the Pleiades or the Hyades.

popular work *Nineveh und Babylon* (1903), the other in his lecture *Die babylonisch-assyrischen Keilinschriften* (1904). The two are independent of each other; they are taken under different conditions of light, and the one serves to control and supplement the other. [See also Ball's *Light from the East*, the Plate opposite p. 198.]

[1] So far as I can judge from my photographs, the surface of this part of the monument does not seem to have sustained any fracture or to have undergone any corrosion. All the bas-relief appears to be in a state of perfect preservation, and the exceedingly delicate figures near it are intact. The conclusions in the text must in any case be accepted with reserve, and subject to the condition that a careful examination of the stone confirms what seems to result from the photographs.

We may conclude, with Professor Stern, that the Assyrio-Babylonian astronomical representations give a clear and simple illustration of the passage in 2 Kings xxiii. 5, where the writer speaks of those who offered incense 'to Baal, to the sun, to the moon, to *Mazzaloth*, and to all the host of heaven.' Only we understand the matter in a somewhat different way: first, because we believe that, not the Hyades, but the planets are represented by the seven stars; secondly, because it seems necessary to distinguish between the various classes of monuments. The first form of these representations, which is found on the most ancient Babylonian cylinders (or on those which are imitated from the most ancient), corresponds to that most rudimentary stage of planetary astronomy in which Venus and Mercury appeared as two stars each: it only contains the sun, the moon, and the seven minor planets. Compared with the Biblical text, these cylinders would lead us to suppose that *Mazzaloth* were simply the planets. But it does not seem a plausible proceeding to set that text side by side with monuments of so much greater antiquity. The *kudurru* or boundary stones dating from the twelfth century onwards already show a different type; the great astronomical triad occupies a prominent place on them, but we do not find the seven stars there, probably because the emblems of the planets belong to the many points connected with these stones which are still unexplained, and we have not yet learned to recognize them. From the examination of these stones, we drew the conclusion in chapter v that *Mazzaloth* might perhaps be Venus. This interpretation seems to be confirmed by the bas-relief of Esarhaddon, where, together with the great divinities of the Assyrian Olympus (the *Ba'alim* of the Bible), appear the three members of the great astronomical triad, the sun, the moon, and Venus (*Mazzaloth*), and the planets ('the host of heaven'). The correspondence with the Biblical text is complete, and is given by a monument which is contemporary with the most flourishing period of idolatry in the kingdom of Judah. The same inferences, and in a no less conclusive form, are suggested by the bronze of Palmyra, mentioned above, which seems to date from nearly the same age. On the upper part of this most singular bas-relief there are figured, first, four (celestial?) divinities surrounded by their

emblems. In attendance comes the great astronomical triad, in the order—Venus, sun, moon—the sun being represented according to the Assyrian type. Finally we have the seven stars, very regularly arranged in their two lines, containing four and three stars respectively. Here too there are *Ba'alim*, *Mazzaloth*, the sun, the moon, and the host of heaven. The precedence given to Venus over the sun and moon indicates a date when the worship of Ištar prevailed among the Assyrians over every other, and this brings us to the age of Asshurbanipal, who is known to have been especially devoted to the cultus of this goddess and who reigned for thirty years contemporaneously with his vassal Manasseh, the idolatrous king of Judah.

APPENDIX III

THE WEEK, AND THE WEEK OF WEEKS, AMONG THE BABYLONIANS.

In a note to chapter ix (p. 132), I have briefly indicated the results which can be drawn on this subject from the numerous dates inscribed on the Babylonian tablets, and I have applied this principle to the series of about 400 transcribed by Boscawen (*Trans. Soc. Bibl. Archaeol.* vi. 47–77). These dates, as I have been further able to prove, contain some mistakes in writing, and the conclusions drawn from them require some correction. This consideration has led me to make a more extensive study on a more reliable basis, namely, of the long series of Babylonian documents on tablets preserved in the British Museum, published in their original form, by Strassmaier[1]. The part of this collection which has

[1] *Babylonische Texte, von den Thontafeln des Britischen Museums copirt und autographirt von J. N. Strassmaier, S. J.:* five volumes containing the inscriptions of Nabonidos, Nebuchadnezzar II, Cyrus, Cambyses, and Darius I respectively. The gap between Nebuchadnezzar and Nabonidos has been filled by Evetts, *Inscriptions of the reigns of Evilmerodach, Neriglissor, and Laborossarchod*, in the same form as that adopted by Strassmaier. The two short gaps of the reigns of Smerdis and Nebuchadnezzar III remain to be supplied.

hitherto been edited contains 3,148 tablets, nearly all commercial or civil deeds, and the dates contained in them run from the year of Nebuchadnezzar II's accession to the throne to the twenty-third year of Darius I (604–449 B.C.). In some of these dates the day of the month is not given, in many others it has been lost through the fracture or decay of the tablets. Excluding both these classes (amounting to 384 in all) there remain 2,764 dates: if these are classified according to the day of the month, the following is the result: —

Day of the month.	*Number of dates.*	*Day of the month.*	*Number of dates.*
i	76	xvii	84
ii	109	xviii	67
iii	102	xix	12
iv	84	xxi *lal.*	77
v	107	xx	107
vi	92	xxi	121
vii	100	xxii	129
viii	105	xxiii	68
ix	86	xxiv	97
x	120	xxv	98
xi	86	xxvi	85
xii	86	xxvii	78
xiii	99	xxviii	91
xiv	98	xxix	51
xv	114	xxx	48
xvi	87		2,764

If we divide the total 2,764 by 29·53 (the number of days contained in a lunar month), we find that each day of the month ought on an average to be given on 94 tablets. As a matter of fact, many of the numbers on the second column only vary slightly from this figure, showing a degree of variation which can be attributed to accidental causes. But there are some large deviations which cannot be explained in this way. Among the considerations suggested by the examination of the preceding table, I shall only indicate those which are connected with the subject of this Appendix.

I. Against the four days which are marked in the calendars as *dies nefasti*, the 7th, 14th, 21st, and 28th days, we find the numbers 100, 98, 121, 91 respectively: the first three of these are above the average 94, and the last is only slightly below it. The idea, therefore, that these days

brought misfortune would seem to have had no practical effect among the Babylonians of the time of Nebuchadnezzar and of Darius I, and not to have prevented them from concluding contracts or civil deeds of any kind. It would be much less possible still to suppose that these days were a real Sabbath, that is to say, a day of rest such as the Jews had, and such as Christian countries still have. The division of the month into four weeks was probably for religious purposes only, and parallels for this can be found in the rituals of Mazdeism and of the most ancient Buddhists. It is in this sense only that it would be legitimate to speak of a Babylonian week, at least during the time over which the documents extend with which Strassmaier deals.

II. Mr. Pinches has recently discovered that the name *shapattu* was given by the Babylonians to the 15th day of the month[1]. The preceding table gives the number 114 for the 15th day, which far exceeds the average 94: in this case again, therefore, it is clear that we cannot speak of a day of rest or of cessation of business. Perhaps, as Mr. Pinches observes, the word *shapattu* refers to the position or appearance of the moon at its full, and has nothing to do with religious ritual or with human business[2].

III. The 'week of weeks' falls on the 49th day after each new moon: if the month be of thirty days, on the 19th day of the next month. This 19th day is marked in the calendars as an *ûmu limnu* or *dies nefastus*. In civil deeds and contracts the 19th day is nearly always avoided, and it is very rarely written on tablets. In the preceding table the 19th day of the month only occurs twelve times. This should not, however, lead us to conclude that deeds and contracts were not concluded on the 19th day of the month. On this day the Babylonians attended to business as on other days; but they avoided the ill-omened date 19 by generally writing instead of it XX·I·*lal*, which means 20−1[3]. In the preceding table we must refer to the

[1] *Proc. Soc. Bibl. Archaeol.* xxvi. 51 and 162.

[2] Ib. xxvi. 55. [Cp. p. 132 above.]

[3] Epping, in his remarkable studies on the Babylonian tablets, was the first to recognize the fact that any number followed by the sign *lal* is to be understood as a number to be subtracted or, to use an algebraical term, as a negative quantity (*Astronomisches aus Babylon*, p. 11). Accordingly I *lal* is equivalent to −1; and XXI *lal* must be interpreted as

19th day of the month, not only the 12 dates marked by the number 19, but also the 77 marked by XXI *lal.* In all, therefore, we have $12 + 77 = 89$ dates for the 19th day of the month, and this only falls slightly below the average 94.

IV. The documents published by Strassmaier enable us also to answer another question—whether the Babylonians had any institution similar to the Hebrew Sabbath, according to which they were obliged to abstain from all work at fixed intervals of 7 days, independently of any consideration of the moon's phases. This problem cannot be solved as simply as the one already discussed. Yet the large quantity of available documents allows us to give a certain answer. It will be enough, without reproducing the calculations which I have made, to say that the result, as might have been expected, has been entirely on the negative side. An equally negative result is produced if we suggest a period of 5 days instead of a week of 7 days. It seems that the Babylonians were not in the habit of interrupting their business affairs on days fixed by the calendar. Not even during the great solemnities of the beginning of the year, which seem to have extended from the 1st to the 11th day of the month Nisan, can a partial cessation of business be shown to have taken place. Of the 2,764 documents dated by Strassmaier, 94 were written on the first 11 days of Nisan. The average number for 11 days taken from any part of the year would only be 83.

This arithmetical method of studying the large mass of Babylonian documents may lead to other results also: but of these, as they have no relation to the Jewish Sabbath, this is not the place to speak. I shall only allow myself to add the hope that the great work of Strassmaier may be completed and extended as far as possible. The copious material already collected in the British Museum can serve for this object, and further means are furnished by new excavations, especially by those which the Americans are now carrying on at Nippur.

XX-I *lal* $(20 - 1) = 19$. Boscawen read XXI *lal* as 21 throughout, and so also did Strassmaier in the first volumes of his publication. But in the last volume (*Inscriptions of Darius I*) he writes it correctly as 19. So too does Evetts in his supplementary volume.

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